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REPORT

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OF THE

BOARD OF REGENTS

OF THE

UNIVERSITY OF NORTH DAKOTA.

REPORT

OF THE

PRESIDENT

OF THE

BOARD OF REGENTS

OF THE

UNIVERSITY OF NORTH DAKOTA.

UNIVERSITY OF ILLINOIS
PRESIDENT'S OFFICE.

PLAINDEALER JOB ROOMS,
GRAND FORKS, D. T.
1888.

PRESIDENT'S REPORT

Board of Regents University of North Dakota.

Grand Forks, Dakota, *December* 10, 1888.

Hon. L. K. Church,
Governor:

I have the honor to submit herewith a report of the present condition and future requirements of the University of North Dakota.

Your favorable consideration of our needs is earnestly requested, and your cordial support of our requests to the approaching legislative assembly is relied on to aid us in securing their prompt and favorable action.

I beg leave to refer to the report submitted to your Excellency, by request, October 1st, ultimo, and to repeat here the suggestions therein made, and to submit the estimates of appropriations needed for the University for the ensuing two years.

We have now in attendance 156 students, with advices of quite a number of others who contemplate coming to us after January 1st, prox. Notwithstanding the erection, last year, of a dormitory building capable of accommodating 80 students or more, its capacity is now tested to the fullest. We have been obliged to convert a considerable portion of the main building, or University proper, into sleeping rooms for the young men, even to the extent of putting up beds in the halls under the stairs, to avoid turning away any one for lack of sleeping accommodations. Although no trouble has been experienced so far, this crowded condition militates against good order and discipline, and interferes with the proper pursuit of their studies on the part of the students, and gives greater care and solicitude to the president and professors.

The anxiety manifested to take advantage of this means for thorough, higher education is a conclusive and satisfactory argument for the establishment of this Institution, and the numbers in attendance argues still stronger for its proper equipment and maintenance. In asking appropriations for our University, I beg leave to refer to the fact that it is the only institution of the kind in this part of the Territory; it is now established and working on a good, solid, educational basis. Its advantages are becoming more apparent and pronounced each year; its corps of professors is not excelled by any educational institution of its age anywhere. We are aware of a large number of young men and young women yearly seeking just such advantages as this University affords them, and their numbers will constantly increase. They are just the ones of the rising generation whom it is desirable to keep with us, and by offering them here the educational facilities they seek, prevent them from going outside of the Territory.

We feel no hesitation in asking, and are of the opinion the legislature will have no hesitation in granting all we ask, when the fact is considered, outside of the necessities of the case, that there is a large educational fund in reserve, in the school lands, upon which to draw in the future for the liquidation of any indebtedness now incurred, and which, by the time it can be utilized, will not only be sufficient for that purpose, but ample to assist in maintaining our educational system for all time to come. I would claim your careful consideration of these reasons, and your earnest presentation of them to the attention of the legislature, bespeaking cordial support on their part for our interests.

In the first place there is needed to refund the amount advanced by the citizens of Grand Forks to rebuild and repair the damage inflicted by the storm of June, 1887, the sum of $20,700. For the details of that occurrence, I respectfully refer your Excellency to my letter written after the storm, and my remarks thereon in my report of October 1st, ultimo:

For furnishing and heating the Dormitory building erected last year—the inconvenience arising from the lack of this provision I have already called attention to in my previous report—the sum of. . . . .$ 6,000

For a Dormitory building, the sum of. 25,000

The necessity of this building I have shown in the present crowded condition of the rooms for the young men, and the impossibility of taking care of the numbers ready to come to us, as soon as they can be provided with these accommodations.

For a Gymnasium building, the sum of. $10,000

I have called attention to the importance of this necessity in my previous report, and here repeat, with all the force of language, that the accommodation asked for is one of great benefit and advantage to students, conducive of health, good order and discipline.

We propose to utilize a building of this kind not only for a Gymnasium, but also for a Drill Hall in the winter and inclement weather, and Music Hall for instruction in that art, the practice, of which now in the Dormitory and Main Building, is somewhat of a drawback to the quiet that should generally characterize those places.

For Salaries of President and Instructional force	$40,000
" Incidental fund	4,000
" Museum fund	3,000
" Library fund	2,000
" Apparatus fund	3,000
" Fuel and lights fund	6,000
" Water Supply fund	1,800
" Janitor and Engineer fund	4,000
" Grounds Improvement fund	1,000
" Secretary and Superintendent	2,000
" Buildings Repair fund	5,000

The necessity of some funds upon which to draw for the needful repairs of the buildings and heating appliances has been forced upon our attention repeatedly during the past two years. The repairs are of constant occurrence, in most cases but slight and of small expense, if attended to promptly when needed, but if neglected are sure to become in time serious, not only in damage to buildings, but also in the matter of expense of repairing. Moreover, after every winter's use, the boilers used in steam heating need overhauling and renovating, the pipes and radiators and their connections need the services of a plumber to keep them properly serviceable. Heretofore this work has been more neglected than should be the case with the proper protection of public property, and it has been a constant source of worry and annoyance to the Board of Regents that there has been no money at their command for use in this direction. Hence the amount asked for in the "buildings repair fund" is considered of the greatest importance.

Attention is respectfully called to the appropriation passed at the last session of the legislature, but which failed of approval, by which the Board expected to pay an indebtedness due Mr. J. S. Bartholomew, for work done and material furnished in the erection of an addition to the main building in 1884. The legislature, during the session in 1885, passed a bill to cover the expense of this addition, but through some oversight or clerical error on the part of the Board of Regents at that time, the amount asked for and appropriated, was not sufficient to cover the entire cost of the building, and the contractor, Mr. Bartholomew, has been waiting for the balance of his money ever since. At the last session of the legislature a bill passed both houses, appropriating money out of which to pay this debt, but, as already stated, failed of approval, and hence nothing could be done but await favorable action on the part of the next assembly. It is therefore our earnest desire that an appropriation of $2,000 be made by the legislature at the coming session to meet this obligation, justly due, and of such long standing.

With an intelligent understanding of the situation, we are impressed with the importance and necessity of obtaining the assistance asked for, and we again earnestly request your hearty co-operation in our behalf, feeling as we do that our demands have by no means exceeded the absolute needs of our growing and prosperous University.

Very respectfully,
W. N. ROACH,
President Board of Regents.

PRESIDENT'S REPORT

Board of Regents University of North Dakota.

GRAND FORKS, D. T., *October* 1, 1888.

HON. L. K. CHURCH,
Governor:

I have the honor to submit herewith the report of the Board of Regents of the University of North Dakota:

The school year that closed on the 16th day of June last was one of unprecedented success in the history of the University, as well with reference to the number of students in attendance as the progress made in the attainment of the higher aims of the course of study therein. The number of students attending during the year was 98; of these there were 5 juniors, 9 sophomores, 13 freshmen, 28 normal, 32 in the preparatory department and 11 special students unclassified. The number during the previous year was 75 in all.

The health of students and professors has been generally excellent, no serious sickness of any kind prevailing at any time.

The Board of Regents were fortunate enough to secure the services of Prof. Homer B. Sprague as president of the University, and he was elected to that position at the annual meeting in 1887. Prof. Sprague has a national reputation as an educator, and his executive ability and able management of the institution during the past year fully demonstrate the wisdom of his selection for its head.

The annual reports of the several professors and tutors all tell of good work done and satisfactory progress made in the several classes, and all bear testimony to the uniform good behavior of the students.

Owing to the amount of labor devolving upon the several professors, it was found necessary to increase our instructional force for the ensuing year. At our annual meeting in June last a professor of mathematics, physics and astronomy was duly elected upon the recommendation of the faculty, and there was also elected a teacher of music and drawing upon the unanimous recommendation of the faculty of a suitable person for that position.

Upon this subject of music the president of the University, in his last annual report, says: "It is, in the opinion of the faculty, in the highest degree desirable, and they have passed a vote to that effect, that an instructor be appointed for music, drawing and normal work.

"A teacher of piano and organ music is likely to be a necessity in the near future. I know of no feature more likely to prove attractive in the University curriculum; and, if the means at the disposal of the regents will permit, I hope that a department of music will be at once established."

With this educated opinion before us, we took the only action allowed by our financial condition, in engaging, at a modest salary, the best teacher we could find, trusting to the liberality of the next legislature to provide the means for the establishment of this very desirable addition to our University curriculum upon a solid basis and with suitable accommodations.

The Dormitory building, for the erection of which the last legislature made an appropriation of $20,000, was completed and occupied about the first of the present year. The board feel that they can point with pride to this imposing structure as being the finest, most conveniently arranged and best constructed for the outlay of any building erected by the authorities of the Territory. We have been somewhat hampered in the most complete usefulness of this building by reason of the failure of the legislature to provide for heating and furnishing the same, and we have been compelled to provide as best we could for the deficiencies, trusting to the next assembly to make the necessary appropriation therefor. I shall take occasion to call attention to this, as well as our other needs, in a subsequent report to your Excellency before the next legislature convenes.

I had the honor to advise you, at the time of its occurrence, of the damage sustained by the University buildings and surroundings in the storm of June, 1887. I take the liberty of reverting to it at this time for the purpose of refreshing your mind on the matters therein contained. The work of rebuilding and repairing damages was entered upon as promptly as circumstances would permit. The storm occurred on the 16th of June, 1887. Aware of the importance of being ready for the opening of the school in October, the Board of Regents, through the liberality and public spirit of the citizens of Grand Forks, were enabled to raise the necessary funds, and set about the work with such energy and good judgment that no delay was incurred in opening the University at the regular time for the admission of students, and classes were formed and professors at work as if nothing had happened. When the great and serious damage incurred by the storm is fully comprehended, some idea of the immense amount of work required may be formed. To raise money (several thousand dollars) and push this work to completion in the limited time allowed before the school opening was work that taxed our energies to the utmost, and my colleagues on the board have earned the thanks of those in authority, as well as of the people generally, for the unrequited time and labor spent in this sudden and unlooked-for emergency.

In addition to the damage to buildings, fences, etc., the trees that had been set out around the grounds, and most of which were in a flourishing condition, were, to a great extent, either killed outright by the flying debris or injured to such an extent that they subsequently died. These were all renewed last spring, and, in addition, the professors and students turned out on Arbor Day and planted quite a number of trees of good size and variety, all of which have made a good growth during the season, giving promise of adding much to the beauty and attractiveness of the grounds at no distant day.

The library of the University has been greatly increased by a judicious use of the money appropriated for the purpose, adding many valuable books, and contains at the present time about 2,000 volumes. These works have all been selected with the utmost care as a basis of a collection that will be valuable and useful for all time to come.

A very good beginning has been made towards the establishment of a physical laboratory and the best use possible made of the money at command in the purchase of the most approved appliances for this very necessary adjunct to the requirements of our course of study.

The equipment of a chemical laboratory has been judiciously selected, as far as our means will allow, and although we feel proud of this feature of our work, our needs require that this equipment be considerably enlarged and suitable rooms, or a special building, be set apart for the unrestricted and better performance of the work pertaining thereto.

Our museum, which suffered the loss of many of its specimens by the storm already referred to, many never recovered and many damaged beyond repair, has been replenished and rearranged as far as it is possible to do so. The most serious loss in this connection was sustained by Prof. Henry Montgomery, curator of the museum, who had his entire valuable collection stored therein, kindly loaned by him for the use of the students in his department. This whole collection was entirely destroyed —swept away in a moment by the fury of the storm—what it had taken the professor years of patient toil and hard work to accumulate. Many of these specimens can not be duplicated, so that the loss to him is irreparable.

Apparatus and appliances for a gymnasium have been supplied, and classes in calisthenics were formed during the year. Much interest was manifested by the young women, as well as the young men, in the work of physical culture made possible by this provision. Considerable inconvenience was experienced for lack of suitable accommodations, where this necessary accompaniment of school life could be carried on with comfort and regularity. Since *mens sana, in corpore sano* has been accepted as a truism, it would seem to be part of wisdom to provide the means of securing the "sound body," and keeping it so, and there is no means of acquiring such condition more certain of success than a judicious and regular amount of physical exercise; hence, the establishment and maintenance of a proper gymnasium is the especial care of all well regulated universities. The courses of study, as shown by the annual catalogue, have been carefully revised and enlarged in conformity with the requirements of the charter, the needs of the advanced students and the usages of colleges and universities around us. The standard set up is high, as the aims of our institution should be, and although we work in a new field, and are located in a comparatively young and lately settled country, we hope and expect to come up to the full measure of the lines marked out for attainment. In all these matters attention has been paid to the necessary and practical, avoiding on the one hand the requirements of an impossible degree of scholarship, and on the other, not yielding to the temptation of mere superficiality for the sake of numbers.

As will be perceived by a perusal of the catalogue, the most numerously attended department has been the preparatory. Whilst we shall continue to make this as useful as possible to its members, the hope is earnestly expressed that the time is not far distant when this department can be relegated to the care of the high schools and colleges, where such preparatory work properly belongs, and which, it is hoped, a uniformed system of public instruction in the Territory will make possible, and enable the University to devote itself entirely to its proper and legitimate work.

The normal department has done good work and hopes to do even better in the future, as special attention is being directed to this work. The demands made upon us for teachers from this department of our University attest the confidence felt by the people in the advantages possessed by the University in training teachers.

During the past year a regular military drill was maintained, though somewhat interfered with by the lack of proper arms and accoutrements. Through the courtesy of your Excellency forty muskets were furnished us for this purpose, but they were of an old pattern, quite heavy (too much so for some of the young men) and as there was no "harness" accompanying the guns, much of the useful part of the manual could be imparted only imperfectly. It is to be regretted that the better arms, with complete outfits, could not be furnished us, as we had some fifty members enrolled in the company, and the interest of all was very encouraging. Let me express the hope that your Excellency will be able to supply our needs in this respect in the near future, as it is desirable to keep up the organization of a military company among the students.

Our prospects for the ensuing year are such as to cause a feeling of great satisfaction. The attendance bids fair to fully double the numbers of last year, showing the appreciation by the people of the efforts made to furnish facilities for a higher education, and the necessity of maintaining such an institution and enlarging its scope of usefulness by liberal appropriations.

And just here it occurs to me that it is important to mention the necessity for another dormitory building for the young men.

The one recently erected has been used exclusively by the young women. The young men occupy sleeping rooms in the main building, or University proper. These rooms were never intended for such purposes, are inconvenient, and in every way unsuitable for use as lodgings; besides, owing to the increased attendance, these rooms will be needed for class work, for which they were originally intended.

Our present instructional force consists of—

The president of the university, who is professor of rhetoric and English literature.

A professor of natural sciences.

A professor of Greek and Latin languages and literature.

A professor of didactics, mental and moral science, and also principal of the normal department.

A professor of French and German.

A professor of mathematics, physics and astronomy.

A matron, who is also instructor in English and Latin.

An instructor in voice culture and assistant in the English branches.

An instructor in music and drawing.

Four courses have been adopted by the board as the proper plan upon which to conduct the university at the present time, viz:

The course or college of arts.

The course or college of science.

The course or college of letters.

The normal course or college.

In conclusion, I desire to testify to the ability and devotion to duty of the members of the faculty and instructional force, the untiring efforts of my colleagues on the board, and their unselfish devotion of time and labor in the interests of the University.

All professors and regents are evidently actuated by the one desire to secure the success of the institution under their care.

Very respectfully,

W. N. ROACH,

President Board of Regents.

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—TO THE—

Governor of North Dakota

1896.

JAMESTOWN N. D.
THE ALERT PRINTING HOUSE
1896

PUBLIC DOCUMENT. No. 15

UNIVERSITY OF ILLINOIS
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UNIVERSITY OF NORTH DAKOTA

—TO THE—

Governor of North Dakota

1896.

JAMESTOWN N. D.
THE ALERT PRINTING HOUSE
1896

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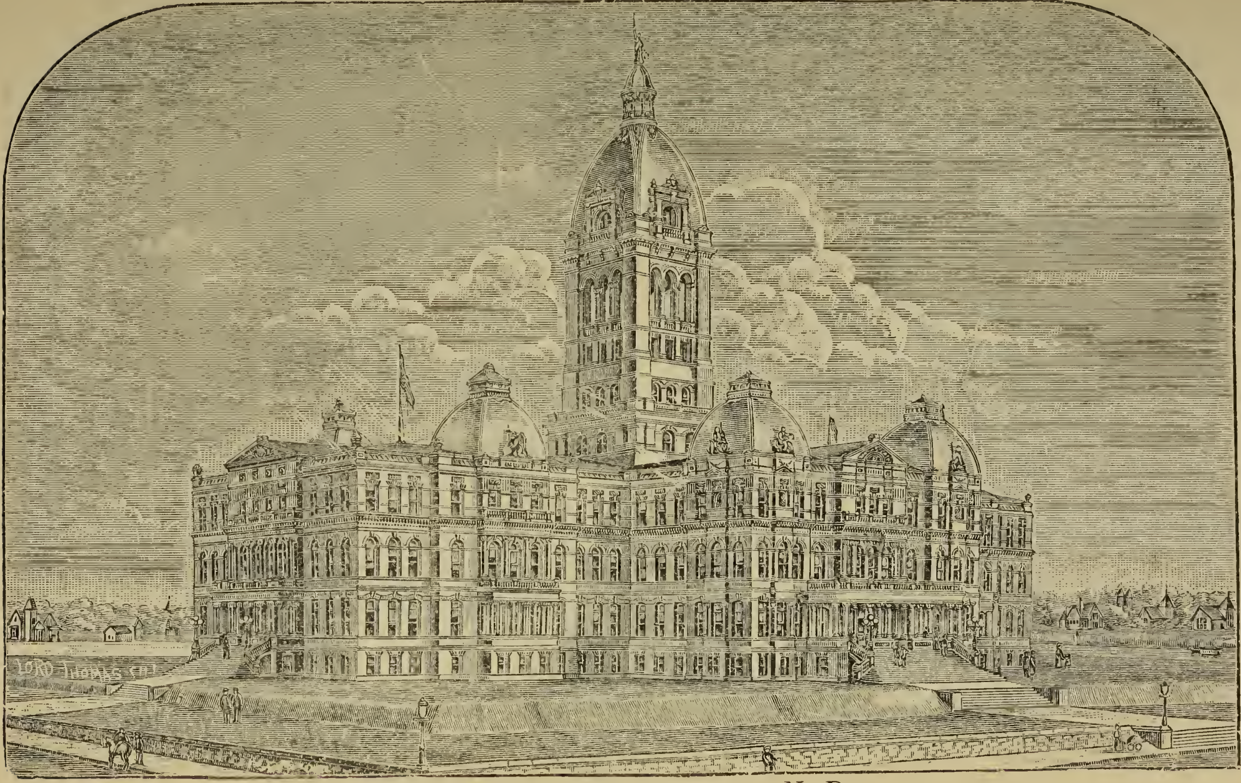
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Professor of Miltary Science and Instructor in Mathematics.

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Professor of Biology and Curator of Museum.

Scandinavian Languages and Literature.

Hannah E. Davis
Instructor in English Literature and Drawing and Preceptress.

George St. John Perrott, B. A.
Instructor in Latin and Greek.

Joseph Guyot, Janitor.

CALENDAR.

1896.

June 17—Commencement in all departments of the University.

June 17—(Evening). Summer vacation begins.

July 27—Summer school begins.

Aug. 31—Summer school ends.

Sep. 21—Entrance examination of all candidates for admission to any class.

Sep. 22—First term begins.

Dec. 23—(Evening.) Holiday vacation begins.

1897.

Jan. 5—Second term begins.

Mar. 26—(Evening.) Spring vacation begins.

April 6—Third term begins.

June 18—Commencement in all departments of the University.

REPORT.

Hon. Roger Allin,

Governor of North Dakota:

I have the honor to submit herewith the report of the Board of Trustees of the University of North Dakota for the biennial period ending September 15, 1896.

The report submitted by this board two years ago set forth with much detail certain pressing needs of the University. Owing to the failure of the appropriation for the University two years ago, it has not been possible to supply these needs and much that was said in that report has added force at the present time. Without further acknowledgment, use will freely be made of such portions of that report as still remain pertinent.

Whether judged by the numbers in attendance, the quality of the work done, or the earnestness and loyalty of the student body, the period under consideration has been one of unusual prosperity for the University. While the numbers in attendance are no true test of this prosperity of an institution of learning, they are a fair indication of the esteem in which the institution is held by the community, and it is a pleasure, therefore, to record the fact that the attendance during the last school year was by far the largest in recent years and considerably larger than in any of the years during which the University was the sole institution of higher learning in the state, instead of being, as at present, one of six such institutions. In no single respect has the growth of the institution been more marked than in the rapid growth of the higher classes. The number of students pursuing studies above the preparatory grade was nearly 40 per cent larger last year than in any previous year, while the last graduating class was more than double the size of any previous graduating class and larger than any class graduated at the University of Minnesota up to twelve years ago.

HEALTH AND SANITATION.

The almost uniformly excellent health of the student body during the last two years is a matter for congratulation. This result, it is believed, is largely due to the systematic training in physical culture afforded the young men and women by a resident instructor.

The most pressing need of the University, from a sanitary point of view, is an artesian well for flushing the coulee which flows through the University grounds, and serves as a receptacle for the sewage of the buildings. During several months in the year there is no flow in the coulee, and the stagnant and polluted water, in such close proximity to the University buildings, must be a serious menance to the health of the institution until provision is made, by boring an artesian well and constructing a reservoir dam, for the periodical flushing of the coulee. A good flow of water has been obtained in several wells near the University at depths ranging from 150 to 160 feet. It is believed that a sufficient flow of water could be secured at a similar depth on the University grounds, at a cost of $1,000 to $1,500, and an appropriation of the latter sum is asked for the purpose of boring a well and constructing a dam.

HEAT AND LIGHT.

During the past two years the University has used for fuel a mixture of hard and soft wood obtained from the banks of the Red River near Grand Forks. This wood has cost about $3 a cord delivered at the University. It has proved the cheapest and, on the whole, the most satisfactory fuel obtainable. No expense connected with the maintenance of the University is more legitimate than the expense for heating. By no possibility can any considerable economy be practiced here. We estimate that the sum of $7,000 will be required for heating the University during the ensuing two years.

The institution has thus far been lighted by kerosene. This method of lighting, though comparatively cheap, is attended by far too great a risk from fire. The buildings are all equipped with fire hose, couplings, etc., and the military companies are given a sufficient number of fire drills each year to render them fairly efficient as fire companies. But the danger from fire with nearly or quite one hundred kerosene lamps burning for five hours each evening, during several months of the year, is obviously too great a risk for the state to assume. The trustees carry a reasonable insurance on buildings, furniture and apparatus, but a very considerable loss to the state and a very serious interruption of the work of the University would necessarily result in case of fire. It is urgently recommended that an appropriation be made by the next legislature for lighting the University by electricity. A most pressing need of the University is a new boiler house. At present the heating apparatus is located in the basement of the main building. This building is occupied by about two hundred students and instructors during the working part of the day, and by some forty young men as a dormitory at night. An explosion of the boilers would most certainly be fraught with consequences not pleasant to contemplate. For this and other important reasons the boilers should be removed to a detached building specially constructed for the purpose. Fifteen thousand dollars would, it is estimated, provide a suitable boiler house and an electric plant sufficient to light the University buildings. By the addition of a single boiler to the present heating plant, electricity could be generated for lighting at comparatively slight expense. An appropriation of $15,000 is respectfully requested for this purpose.

In this connection it may be well to call attention to the imperative need of a small gas plant for the supply of the three science laboratories. This need is most inadequately met at present by the use of alcohol lamps and gasoline furnaces. This substitute, aside from its inadequacy, is both costly and dangerous The expenditure of $1,000 for the construction of a small gas plant would be quite as much in the interest of economy as of increased efficiency.

REPAIRS TO BUILDINGS AND GROUNDS.

The sum of ten thousand dollars is required for repairs to buildings and grounds for the ensuing two years. Owing to the failure of the appropriation not a penny has been appropriated during the last two years for repairs to building and grounds. A liberal appropriation for this purpose is the highest economy. A small but seasonable expenditure for repairs may save the State an eventual expenditure of many thousands of dollars. The main building has been in almost continuous use for more than twelve years and is needing extensive repairs within and without. Especially do its outer walls need repainting. They are already presenting a shabby appearance, highly discreditable to a state institution. This work should not longer be delayed. Ten thousand dollars will not more than suffice for urgently needed repairs.

INCIDENTALS.

There are always numerous calls upon the Trustees for expenditures which cannot be specifically enumerated or, in many cases, anticipated. To provide for these expenditures an appropriation is always made for incidental expenses. The board has more than once been seriously embarrassed by an inadequate appropriation for this purpose. The sum of five thousand dollars is respectfully asked on this account for the ensuing two years.

THE LIBRARY.

Owing to an unfortunate oversight no provision was made by the legislature four years ago for the maintenance and increase of the University library. During the past four years, therefore, not a single book has been added to the library by purchase. A University without a library would be an absurdity; one possessing a library to which no additions are made, runs the risk of becoming as fossilized as the source from which it draws its inspiration. It is earnestly hoped, therefore, that adequate provision will be made for this most important department of the University. An appropriation of $3,000 was made by the legislature for the maintenance of the library for the biennial period 1890-'92. In view of the fact that no books have been purchased during the past four years; that the periodicals accumulated during that time remain unbound and are, therefore, held out of use; that it has been found necessary, even, to discontinue temporarily our subscriptions to many periodicals; an appropriation of $3,000 for the library for the ensuing two years will not more than satisfy the most pressing needs.

THE NATURAL SCIENCE DEPARTMENTS.

The courses in Science now offered in the University are equal to many of those in older and richer colleges. The work of some of these departments is known and respected in every important institution of learning in the country. Some of the most important papers recently published in the scientific journals of England and Germany, as well as of America, have been contributed by instructors in our State University. Owing to the failure of the appropriation two years ago the supplies in all the laboratories have been exhausted. The number of students taking laboratory courses is nearly double that of two years ago. In view of these facts the estimates submitted in the following departmental reports are the very lowest consistent with the maintenance of the departments upon anything like their present plane of efficiency and it is most earnestly hoped that no attempt will be made to scale the estimates here submitted.

I submit herewith brief reports of the work and needs of the three science departments, made by the professors in charge.

DEPARTMENT OF BIOLOGY.

To the President of the Board of Trustees:

In every State University the department of Biology has a two fold purpose, the giving of instruction and the prosecution of research. Both objects are to be attained in commensurate proportion to the scope of work outlined, the number and efficiency of workers engaged, and the appliances and equipments at their disposal.

In the department of biology in the North Dakota State University a course of instruction, elsewhere specified in this report, in animal and vegetable biology is so arranged that the student gains a comprehensive conception of the structure and physiology of typical forms in a progressive series from the lowest to the highest animals and plants. In advanced Biology, the students intending to enter different professions are directed to subjects particularly pertinent to their contemplated course of study; for example, those expecting to study medicine are especially instructed in the nature and identification of Bacteria, which cause all contagious and infectious diseases, also in the methods of securing immunity from the various bacterial forms.

Those who intend to farm are directed to the adaptation of plants to climate and soil, the relative value of forage grasses and the needs of forest cultivation and preservation. The subject of weeds and their relation to crops is one that is thoroughly impressed upon the minds of prospective agriculturists. The basis of this specialization is secured in thorough but less advanced courses of study required of all science students.

The research work of the department is conducted with reference to economic and scientific results. An endeavor is being made to determine the distribution and economic value of various forage plants, to gain a knowledge of the character and vitality of certain weeds and how to exterminate them; to identify the organic forms in water supplies and to observe their physiological effects upon different animals.

This instructional and experimental work suffers greatly for lack of sufficient room. Often students of three different classes are working in the same laboratory, equipped for one class only. It is perfectly clear that students as well as professional men must have apartments for the special study of their subjects in order to secure the most satisfactory results. The sooner the pressing need for a Science Hall at the State University is appreciated and supplied by the state, the sooner will she secure the benefits that can only accrue from judiciously equipped institutions of learning and research. In the present limited quarters there is an increasing demand for gas in the biological laboratory. The alcohol lamps are often insufficient to supply the temperatures needed for cultures and microscopic technique, and unless most carefully watched accidents are sure to attend their use which might result in firing the main college building. It is strongly recommended that a local gas plant be provided, in order to secure needed facilities for gaining high temperature and the removal of a source of possible disaster to the University property.

As the standard of instruction improves the requests for advanced work become more numerous. These demands can not be met by the department satisfactorily without proper equipments. If this branch of college work is to grow and attain any considerable success, equipments in apparatus, reagents and laboratory material should be provided. Therefore to partially satisfy the needs of the Biological department I respectfully suggest that an appropriation of $1,500 be made by the state legislature, this appropriation to be divided and used as follows.

For apparatus and fixtures	$1,000
Reagents	400
Laboratory material	100
Total	$1,500

Respectfully,

MELVIN A. BRANNON,
Professor in Charge.

DEPARTMENT OF CHEMISTRY AND GEOLOGY.

To the President of the Board of Trustees:

The work of the Department of Chemistry and Geology is two-fold, namely, that of instruction and that of investigation. The work of instruction will be outlined in another part of the general report. Besides the regular class work, a large amount of scientific investigation is being carried on constantly in this department. The work is of a practical nature and consists for the most part of analysis and value determinations of specimens of various kinds, such as minerals, soils, vegetable products, waters, etc., which have been sent in from various parts of the state. It is not an easy matter to recognize the volume and importance of such work.

Considerable field work has been carried on with a view to the development of the natural resources of the state. Preliminary investigations have been made in such subjects as the growth of sugar beets in this state, the extent and value of the coal deposits, and the rare clays of North Dakota. These investigations have been limited by lack of funds and lack of help in the department.

It is hoped that the Legislature will be liberal in its support of this department and thus make it possible to extend these investigations. The increasing demands upon the department of Chemistry and Geology for such work as has just been mentioned, and the rapidly increasing number of students seeking advanced courses in Chemistry call for a corresponding increase in rooms, apparatus and help. An assistant in analytical chemistry is much needed. The laboratory room is altogether inadequate to the character and volume of the work undertaken. If possible, a science building should be provided. Heretofore there has been too little money available for chemicals and apparatus.

Most of the apparatus and many of the chemicals required are costly. A generous equipment is absolutely necessary in order to do good work. The laboratory is in great need of gas. The present method of supplying fuel for chemical manipulations, i. e., by alcohol and gasoline, is unsatisfactory, costly and dangerous. I trust that a sufficient sum will be appropriated for this need.

I reccommend that the Legislature be asked to appropriate as follows for the Department of Chemistry, Geology and Mineralogy:

Laboratory apparatus	$ 750
Chemicals and chemical apparatus	750
Total	$1,500

Respectfully,

E. J. Babcock,
Professor in Charge.

MATHEMATICS, PHYSICS, AND ASTRONOMY.

TO THE PRESIDENT OF THE BOARD OF TRUSTEES:

Three years ago all progress toward a suitable equipment of this department came to an end. For five years previous a small sum amounting to perhaps a yearly average of $300 or $400 had been available for this purpose, and it was carefully and economically applied to laying a foundation and securing the simplest and most indispensable outfit with which any pretense of carrying on such work could be made. By this means the equipment was, however, able to reach a point but little, if any, beyond that found in some of the best academies and high schools, while, in some respects, it is inferior to what may be found in the latter. It is mortifying to find in such institutions, besides in many small colleges throughout the west, advantages superior to those offered in our own State University.

For three years the department has been unable to draw upon the aforesaid resources, meagre as they were, and has, in consequence run sadly short of the necessary current supplies.

Realizing the continued need of economy, I have cut my previous estimates of expenditures, which would be highly desirable, down to the point where further reduction would involve positive loss, and I therefore ask for the following appropriation:

For Astronomical and Physical Apparatus....................	$1,500

In addition I urge the appropriation of not less than $1,000 to provide gas for the science laboratories.

Respectfully,

LUDOVIC ESTES,
Professor of Mathematics, Physics and Astronomy.

THE MUSEUM.

To the President of the Board of Trustees:

One of the growing demands in North Dakota is a safe depository for a complete and representative collection of her native resources, botanical, zoological and geological. This demand is increasing for two reasons; the first is, that many of the living and fossil organic forms are disappearing, the former being exterminated by adverse conditions and the latter disintregating with continued exposure or being discovered and appropriated by outside investigators; the second reason is that, were these specimens collected and rightly classified, they would afford invaluable means of education to the students of this and adjoining states. To illustrate the value of museums in educational work one must remember that the Natural History of a country is represented by its animals and plants; that ancestral forms are represented only by fossils, many being found in great abundance in the geological deposits of this state: that the forms of today are subject to the same laws their ancestors were and with changing conditions some will survive while others will be exterminated by incoming forms; and that in no other way can these lessons be so clearly taught as by a collection and classification of the organisms themselves. These specimens will furnish the facts and data regarding the favorable and unfavorable conditions which prescribe certain limits to living matter everywhere, and afford the proper material for laboratory study of physiological laws and economic value of plants and animals.

An endeavor has been made, in the development of the museum at the State University, which, so far as known, is the only state museum in North Dakota, to make collections of native resources and utilize them for educational purposes rather than for side shows or mere attractions to those who pine for amusement. An attempt is being made to gather the representative clays, coals and fossils from various portions of the state, to collect and preserve the typical animals of North Dakota, many of which are almost extinct, and also to secure a botanical collection which shall be most instructive to our students in the study of crops and forage grasses.

This collection cannot be made without proper assistance and equipment, but if these are provided the State University

Museum can be greatly enlarged and made correspondingly more valuable as an educational depository of the representative geological, zoological and botanical possessions of the state. Not only will it be a means of great efficiency in promoting the educational interests of the state, but it will be very instrumental in publishing her rich and varied resources to the world. Therefore I beg to recommend that the next legislature appropriate $1,000 to further prosecute the work of collection and identification of the almost unknown mineral, animal and plant resources of this state.

Respectfully,

MELVIN A. BRANNON,
Curator.

LANGUAGE DEPARTMENTS.

Five years ago the sum of six hundred dollars was appropriated for the department of Ancient and Modern languages. With a part of this money certain long needed charts were purchased, also an excellent stereopticon, provided with an oxy-hydrogen light. Such a lantern with a good set of views is indispensable to any institution of higher learning, and has proved a source of great interest and profit to our students. Unfortunately, owing to the failure of the Legislature to make an appropriation for the library at its last session, it was found necessary to divert the larger part of the language fund to paying student assistants in the library and keeping up subscriptions to current periodicals. It is hoped the Legislature will make good this loss to the language department. Four or five hundred lantern slides, illustrative of the life, manners and customs of the peoples, ancient and modern, whose languages are taught in the University, are immediately needed. At present the University owns a fine lantern but not a single lantern slide. The charts purchased by the University twelve years ago were always insufficient and are now practically worn out. It is probably within the truth to say that there is not a first class high school in the state as poorly supplied with maps of all kinds as is the State University. A complete set of wall maps is indispensable to the work of the department of ancient and modern languages, of history and English literature. Almost equally imperative is the need of a carefully selected set of plaster casts and photographs, illustrative of old Greek and Roman life. The sum asked for these departments is small, six hundred dollars, and no appropriation for the University will be more worthily made.

MILITARY DEPARTMENT.

A military department, co-ordinate with the departments of Arts, Science, and the Normal department, was created by the organic act establishing the University. Military instruction is imparted by drills, military gymnastics, recitations and lectures. The course in this department covers four years and is required of all male students, unless especially excused by the Faculty. The federal government details an officer of the regular army to serve as professor of Millitary Science and Tactics at the University. The war department loans the University ninety cadet rifles and accoutrements, cavalry sabres belts, swords, etc., and supplies, free of charge, ammunition for target practice. In return the government requires the University to furnish free quarters to the commandant. In the absence of suitable quarters at the University the last Legislature appropriated seven hundred and twenty dollars ($720) for two years as commutation of quarters for the military instructor. The same sum should be appropriated for the ensuing two years. A further sum of five hundred dollars ($500) is needed to provide the cadets with lockers for their rifles and accountrements, and to defray certain necessary expenses connected with the department, not otherwise provided for. The University cadets, it is believed, constitute by far the best drilled and most efficient body of citizen soldiers in the state. In case of invasion or civil uprising they would be in a position to render the state invaluable service as commissioned and non-commissioned officers for the state militia and volunteers. The state gains more than value received for the small expense entailed by the military department.

SCHOOL OF MINES.

The State School of Mines is located by the constitution as a department of the University and is, by the terms of the enabling act, given a federal grant of 40,000 acres of land. While North Dakota is pre-eminently an agricultural state she possesses in her coals and clays mineral resources of hitherto unsuspected value. In view of the strenuouscompetitionfrom foreign countries which North Dakota is meeting in the production of wheat, it is imperative that she diversify her industry as far as possible by seeking new resources as the basis of industries which shall give remunerative employment to her people. Four years ago Prof. E. J. Babcock, of our geological department, published through the State Department of Agriculture an important pamphlet on "Clays of Economic Value in North Dakota." This pamphlet, with a previous one on the coals of North Dakota, made a most interesting and instructive showing of the state's mineral resources and proved conclusively that North Dakota possesses in her coals and clays the basis of a great and lucrative industry. Investigations carried on in our chemical laboratory since the publication of Prof. Babcock's pamphlets confirm and reinforce the statements and predictions therein made. The existence in our state of extensive and accessible beds of clays suitable for the manufacture of fire bricks, paving bricks, hydraulic cements, and pottery of a high grade is now established beyond question. The development of these resources on a large scale would prove immediately profitable were their existence and value called to the attention of capitalists in an authoritative way. The natural medium of this work is the School of Mines.

At the last session of congress a bill was introduced and unanimously recommended both by the Committee on Mines and Mining and the Committee on Public Lands of the House, providingfor the grant from the federal government of $15,000 yearly to the state school of mines, and an annual increase of $1,000 till the annual appropriation should amount to $25,000. The bill did not reach a vote at the last session but those who had the bill in charge are confident that it will at the next session pass both houses without serious opposition and become a law. Should this bill pass at the next session it is highly important that the school of mining connected with the University be in a position to become a beneficiary under the act. To do this the school must, nominally at least, be in active operation when the federal grant becomes available. A small appropriation, say $1,000, would suffice for this purpose and would enable us to claim the federal grant of $31,000 for the first biennial period. It is respectfully recommended that this sum be appropriated.

STATE GEOLOGIST.

The last legislature created the office of State Geologist and the professor of Geology in the State University was made *ex offico* the incumbent of that office. No appropriation was made for carrying out the provisions of the bill under which the office was created. Professor E. J. Babcock, the present state geologist, has done much work, entirely at his own ex-expense, in the way of beginning a systematic geological survey of the state. He will, either in connection with this report or later, submit a brief report of the progress thus far made.

INSTRUCTIONAL FORCE.

Important as are buildings and apparatus, it is pre-eminently the Faculty that makes an institution of learning. The State cannot expect to have a University of high character and repute unless she employs men competent, by reason of ability and training, for the task of instruction; and such men can not be secured unless the State is prepared to offer salaries equal to those offered by similar institutions in other states. That the present salaries of our professors are not excessive is evident from the fact that half a dozen of our instructors have been called, within as many years, at a very considerable increase of salary, to become the heads of important departments in older and larger institutions. Even the present salaries are not sufficient to retain permanently our best men. A lower scale of salaries would most certainly result in a less able and experienced Faculty and a serious deterioration in the quality of work done in the institution. Our State University is becoming widely known and respected, both in this country and in Europe, through her graduates and the publications of her professors. Few institutions in the West have an abler Faculty or maintain a higher standard of scholarship. It would be a public misfortune if, through a mistaken idea of economy, the coming legislature should reduce the appropriation for instructional force and thus necessitate the cutting down of salaries. If an institution of learning is to maintain a high standard, it must not only supply competent instructors, but it must refrain from so overloading them with class room work that they become mere hacks, without time or strength for study and investigation. The surest way to fossilize an institution of learning is to fossilize its professors by making them mere class room drudges. Our present Faculty numbers thirteen members. Most of them are now giving class room instruction from four to five hours a day—two hours more each day than are required of instructors in any of the great colleges of the country. Our course covers eight years. It is the range of instruction rather than the number of students instructed that determines the size of the faculty. Measured by either test, the number of our instructors is not excessive as compared with other Universities. While our present instructional force could easily give instruction to twice the present number of students in college classes; yet, so long as we maintain a four years' college course, it would not be possible to dispense with a single instructor, were our numbers only half what they are at present. It is not possible, therefore, to cut down the present instructional force, while, to cut down the salaries paid for the past twelve years, would most seriously cripple the University. With possibly two exceptions the salaries paid at our State University are not higher than salaries paid at other universities and are much lower than those paid at most. One of these exceptions is a state university recently started and with only a preparatory department yet developed. The other institution is forced to employ, in the main, young men fresh from college, and finds herself unable long to retain them. She is now making a strong effort to have the salaries of her professors raised. Four years ago $49,800 was appropriated for the payment of the instructional force for the ensuing two years. Fifty thousand dollars will be needed for this purpose for the next two years if the present salaries are to be maintained.

FIXED APPROPRIATIONS.

Many if not most states supporting a State University have substituted for the regular annual or biennial appropriation a permanent appropriation of a fraction of a mill on the assessed valuation of the state. Such an arrangement has much to recommend it, both from the point of view of the state and the University. It would put an end once for all to the unseemly higgling which takes place at each biennial session between the state and its leading educational institutions, with the imputation on the one side that the institution is engaged in a raid upon the state treasury, and the ill-suppressed feeling on the other that the state cares nothing for education and begrudges every penny spent in its support. Every argument for fixed salaries in the case of state officials is valid for fixed salaries for professors in the State University. So great are the advantages of a permanent faculty in an institution of higher learning that a call to a professorship in any college or University in any part of the world is understood to be a call to a permanent position and it has been held that an attempt on the part of a board of trustees to terminate such an implied contract, except for cause, would be actionable at common law. Good men will not be attracted to the faculty where doubt exists as to the permanency of the sal ry offered, and even to the permanancy of the institution itself. Men coming to the faculty of such an institution will invariably insure the risk attending the insecurity of salary or position by demanding a large salary and the institution will invariably pay the premium in this risk, either by the payment of large salaries, or by having to put up with inferior men. It is greatly to be desired that a committee of the most intelligent members of the two houses of the coming legislature be appointed to make a searching investigation of the needs of the University, economically administered, and be empowered to recommehd a fixed tax rate, based upon the assessed valuation of the state, the income from which shall be permanently devoted to the maintenance of the University. As the state increases in wealth the assessed valuation will naturally increase, and it is to be presumed that the institution will grow and its needs increase in about the same ratio.

Respectfully submitted,

DAVID BARTLETT,
President Board of Trustees.

REQUIREMENTS.

Amounts required for maintainance of the University of North Dakota for the ensuing two years.

Salaries of President and Instructional Force	$ 50,000 00
For Department of Biology	1.500 00
For Department of Mathematics, Physics and Astronomy	1,500 00
For Department of Chemistry and Geology	1,500 00
For Museum	1,000 00
For Department of Military	500 00
For Department of Languages	600 00
For the Library	3,000 00
For Repairs to Buildings and Grounds	10,000 00
For Fuel and Lights	7,000 00
For Incidentals	5,000 00
For Commutation of Musters Military Instructor	720 00
For Secretary	1,200 00
For Engineer, Janitor. etc	4,000 00
For Water Rent	1,000 00
For Electric Light Plant and Boiler House	15,000 00
For Artesian Well	1,000 00
For School of Mines	1,000 00
For Gas Plant for Science Laboratories	1,000 00
	$106,520 20

SECRETARY'S REPORT.

RECEIPTS AND DISBURSMENTS.

Statement of receipts and disbursements on account of the University of North Dakota from March 1, 1895 to Sept. 15, 1896.

FUND	Amount of Appropriations	Disbursements from Mar. 1, 1895 to Sept. 15, 1896	Balance on Hand Sept. 15, 1896
Repairs	$ 1,500.00	$ 1,500.00	$
Janitor	3,200.00	2,550.02	649.98
Incidentals	5,780.00	5,780.00	
Water Rent	500.00	500.00	
Deficiency	5,000.00	5,000.00	
	$ 15,980.00	$ 15,330.02	$ 649.98

Receipts from Legislature..............		$15,980.00
Disbursed from March 1, 1895 to Sept. 15, 1896..........................	$15,330.02	
Balance on hand Sept 15, 1896........	649.98	
		15,980.00

List of Orders Issued by the Accounting Officer

	No of Order.	Amount.
W. Merrifield..	1672	$ 208 33
J. Macnie..	3	166 66
H. B. Woodworth....................................	4	166 66
L. Estes..	5	166 66
A. F. Bechdolt...	6	166 66
E. J. Babcock..	7	166 66
J. Kennedy..	8	166 66
G. S. Thomas...	9	166 66
M. A. Brannon......................	80	166 66
G. T. Rugh..	1	100 00
H. E. Davis..	2	83 33
G. St. J. Perrott.......................................	3	75 00
C. S. Farnsworth............	4	45 00
“	5	30 00
Cora Smith Eaton................................	6	10 00
Emma C. Crans.....................................	7	10 00
C. A. Irgebretson...................................	8	11 11
W. C. Hawthorne...................................	9	11 11
E. B. Robbins...	90	11 11
Geo. A. Brennan.....................................	1	8 88
J. T. Douglas..	2	8 88
J Guyot..	3	133 33
City of Grand Forks..............................	4	17 80
E. Tharaldson...	5	344 63
Wm. Flynn...........	6	452 62
P. Gunderson.......	5	692 02
“	8	465 00
“	9	150 00
“	1700	150 00
“	1	294 00
“	2	156 00
“	3	150 00
“	4	600 00
W. Merrifield..	5	208 33
J, Macnie...	6	166 66
H. B. Woodworth.................	7	166 66
L. Estes..	8	166 66
A. T. Bechdolt...	9	166 66
E. J. Babcock..	10	166 66

	No. of Order	Amount
J. Kennedy	1711	166 66
George S. Thomas	2	166 66
M. A. Brannon	3	166 66
H. E. Davis	4	83 33
G. St. J. Perrott	5	75 00
C. S. Farnsworth	6	45 00
C. S. Farnsworth,	7	30 00
C. A. Ingebretson	8	11 11
W. C. Hawthorne	9	11 11
E. B. Robbins	20	11 11
G. A. Brennan	1	8 88
J. F. Douglas	2	8 98
J. Guyot	3	133 33
W. Merrifield	4	208 33
H. B. Woodworth	6	166 66
L. Estes	7	166 66
A. F. Bechdolt	8	166 66
E. J. Babcock	9	166 66
J. Macnie	5	166 66
J. Kennedy	30	166 66
Geo. S. Thomas	1	166 66
M. A. Brannon	2	166 66
H. E. Davis	3	83 33
G. St. J. Perrott	4	75 00
C. S. Farnsworth	5	45 00
C. S. Farnsworth	6	30 00
C. A. Ingebretson	7	11 11
W. C. Hawthorne	8	11 11
E. B. Robbins	9	11 11
G. A. Brennan	40	8 88
J. F. Douglas	1	8 88
J. Guyot	2	133 33
W. Merrifield	3	182 29
J. Macnie	4	145 85
H. B. Woodworth	5	145 85
L. Estes	6	145 85
E. J. Babcock	7	145 85
J. Kennedy	8	145 85
Geo. S. Thomas	9	145 85
M A. Brannon	50	145 85
H. E. Davis	1	83 33
G. St. J. Perrott	2	75 00
C. S. Farnsworth	3	45 00
C. S. Farnsworth	4	30 00
C. A. Ingebretson	5	11 12
W. C. Hawthorne	6	11 12
E. B. Robbins	7	11 12

	No. of Order	Amount
G. A. Brennan	8	8 96
J. F. Douglas	9	8 96
J. Guyot	60	120 83
A. F. Bechdolt	1	83 33
J. Guyot	2	108 33
J. Guyot	3	108 33
Trepanier & Co	4	41 30
The Herald	5	19 00
J. Guyot	6	108 33
J. Guyot	7	108 33
J. Guyot	8	108 33
J. J. O'Leary	9	754 37
Luke & Barnes	70	10 53
Dinnie Bros	1	10 50
J. Guyot	2	108 33
Worden Bros	3	450 00
J. Guyot	4	108 33
Worden Bros	5	450 00
J. Guyot	6	108 33
J. Guyot	7	108 33
J. Guyot	8	108 33
J. Guyot	9	108 33
B. O. Paulsness	80	110 55
J. Guyot	1	108 33
J. Guyot	2	108 33
J. Guyot	3	108 33
J. O'Leary	4	804 99
		$15330 02

W. E. Parsons,

Secretary and Accounting Officer.

UNIVERSITY OF ILLINOIS

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PRESIDENT'S OFFICE.

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1898

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PUBLIC DOCUMENT No. 13

FIFTH BIENNIAL REPORT

OF THE

PRESIDENT OF THE BOARD OF TRUSTEES

UNIVERSITY OF ILLINOIS LIBRARY

OF THE

UNIVERSITY OF NORTH DAKOTA

TO THE

GOVERNOR OF NORTH DAKOTA

1898

UNIVERSITY OF ILLINOIS

PRESIDENT'S OFFICE

BISMARCK, N. D.:
TRIBUNE, STATE PRINTERS AND BINDERS.
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UNIVERSITY OF ILLINOIS
PRESIDENT'S OFFICE.

BISMARCK, N. D.:
TRIBUNE, STATE PRINTERS AND BINDERS.
1898

REPORT.

Hon. Joseph Devine,
Governor of North Dakota:

Sir: I have the honor, as president of the board of trustees of the University of North Dakota, to submit herewith my report for the biennial period just closing. Since my last report was submitted the University has enjoyed a period of prosperity unexampled in its previous history. The requirements for admission, both to the preparatory and college departments, have been very materially raised, till now they correspond with those of the best preparatory schools and colleges in the country. One preparatory class, the lowest, was discontinued at the close of the last school year; and yet the attendance in both preparatory and college departments is now greater by more than 40 per cent than at the date of my last biennial report.

There have been, during the past year, 334 different students in attendance—exclusive of 150 in the summer school—nearly half of whom have been in the college and graduate departments. The Alumni of the University number nearly 100, and each succeeding year sees constantly larger additions to their number. The present graduating class has 26 members; a larger number than any class graduated at the University of Minnesota up to thirteen years ago.

It is hoped that the high schools of the state will soon make it possible for the University to discontinue the preparatory department altogether. At present the high schools prepare about 50 per cent of each Freshman class, the others being prepared in our own preparatory department.

LAW DEPARTMENT.

The organic act, establishing the University, created the following colleges or departments, viz:

1. The college or department of Arts.
2. The college or department of Science.
3. The Normal college or department.
4. The School of Mines.
5. The Military department.
6. Such professional or other departments as now are or may from time to time be added thereto or connected therewith; and the board of trustees is authorized to establish such professional or

other colleges or departments as, in its judgment, may be deemed necessary and proper.

In the judgment of the board of trustees the time has now arrived when a law department may be added with advantage to the University and to the state. It is believed that not less than forty young men whose homes are in North Dakota are at present engaged in the study of law, more than half of them at schools in other states. It is a great advantage for a young man to pursue his law course in a home school, where the code of the state is made the basis of his study. It is believed that a law school established in connection with the University would soon be self-supporting from the fees of the students, and the ten or twelve thousand dollars now annually spent in the pursuit of law courses outside the state could thus be kept at home without expense to the state. Acting upon this belief and the advice of many of the ablest lawyers in the state, the board of trustees at its last annual meeting established a law department to be opened in October, 1899, and made Hon. Guy C. H. Corliss, of Grand Forks, dean of the school. Judge Corliss has signified his acceptance of the deanship and is prepared to enter upon his duties as soon as it shall be necessary to begin the work of organizing the new school.

Many of the leading lawyers and judges in this state have signified their willingness to give courses of lectures before the school, and in this way a very able faculty can be secured at a nominal expense to the state. It will be necessary to have a salaried secretary and assistant to the dean, who will attend to the details of organization and superintendence, taking classes and delivering lectures, in addition to his clerical duties, whenever it shall be necessary. Such a person can be secured, it is believed, for about $1,500 a year. There will be some further expense at the start in the way of providing a small library, renting and caring for quarters, advertising, etc. To meet these expenses an appropriation of $5,000 is needed. It is confidently expected that the school will soon be self-supporting and will even turn a balance each year into the general fund. This is true of the law department of the University of Minnesota and several other state universities.

REPAIRS TO BUILDINGS.

During the biennial period 1895-1897, while the University was supported by the contributions of private citizens, no repairs were made upon the University buildings, owing to lack of funds. The buildings, in consequence, got very much out of repair and at the '97 session of the legislature the sum of $10,000 was asked for to make urgently needed repairs. Only $500 was appropriated for this purpose, a sum entirely inadequate for the purpose. In particular, a crack in the arch of the south entrance to the ladies' dormitory and a sag of nearly eighteen inches in the large unsupported roof of the same building had become positively dangerous through neglect and had to be repaired the past summer, the only alternative being a probable collapse of the building with almost certain loss of life. The merest makeshifts in the way of repairs would have necessitated the expenditure of several hundred dollars, with the probability that repeated wind storms and frost upheavals would again soon weaken the arch and roof and render the building as unsafe as ever. This consideration, coupled with the imperative need of more room in the ladies' dormitory, suggested the following improvements: (1) the walling up of the two end arches, never strong enough for the strain upon them, thereby gaining two excellent rooms from the lobbies thus closed; and (2) the finishing off of the large attic, which had never been used, into some thirteen or fourteen living rooms, together with two large and greatly needed hospital wards, thereby strengthening, in the only permanent way possible, the heavy roof. The need of additional room will be appreciated when it is stated that, last year, every room in the ladies' dormitory had four occupants and numbers of young ladies were sleeping on cots in the upper hall. While the building was in this crowded condition an epidemic of measles broke out, followed by two cases of diphtheria. There was no place to segregate the sick or even properly to care for them without segregation; and for some days it seemed that the closing of the institution would be unavoidable. Such crowding is unhygienic in the extreme and is in the highest degree prejudicial to study. Young ladies had, for more than a month previous to the opening of the winter term, been refused admission to Ladies Hall, the fact being published in the local papers and intending students warned not to come. It was only when students came unannounced from distant parts of the state and begged to be allowed to remain and sleep on cots in the hall that the management consented to receive them. The University is situated two and one-half miles from Grand Forks and it is almost impossible for young ladies to board in town and go back and forth to classes in our cold winter weather, to say nothing of the very considerable increase of expense in boarding in town. Our students come from farms or small villages remote from high schools, and cannot get, at or near home, the instruction they seek. The University offers facilities in the way of instruction, library, laboratories, and museums which cannot be had elsewhere in the state; and it was but the dictate of the most obvious economy, under the circumstances, to enlarge the dormitory accommodations and thus utilize as fully as possible these costly appliances of instruction.

The improvements to Ladies' Hall have cost about $4,700; but the capacity of the building has been increased by fully one-half, and the building very greatly strengthened at points where it had been weakened nearly to the point of collapse. This expense includes plumbing, steam fitting, and furnishing the new part and partially replenishing the furniture of the original building, which had become worn by ten years of continuous service. An additional deficit of about $500 has been caused by boring an artesian well upon the bank of the coulee into which the sewage of the University building is drained. This coulee is sluggish except at the time of the spring floods, when it is usually well flushed; but last spring, owing to the light fall of snow last winter, the coulee was not flushed as usual, and it has in consequence become exceedingly offensive from the accumulation of the sewage of an entire school year, including two summer schools. The presence of an open cesspool within 150 feet of the main building and ladies' dormitory is a serious menace to the health of the student body, and some relief has become imperative. By constructing an inexpensive reservoir it is believed that the coulee can be flushed periodically from the accumulated flow of a single artesian well of four inch bore, or at least from two such wells. At this writing the borers are still at work, a small flow having been struck, but an insufficient one for the purpose in hand.

HEAT AND LIGHT.

During the past two years the University has used for fuel a mixture of hard and soft wood, obtained from the banks of the Red River near Grand Forks. This wood has cost about $3.00 a cord delivered at the University. It has proved the cheapest and, on the whole, the most satisfactory fuel obtainable. No expense connected with the maintenance of the University is more legitimate than the expense of heating. By no possibility can any considerable economy be practiced here. We estimate that the sum of $7,000 will be required for heating the University during the ensuing two years.

The institution has thus far been lighted by kerosene. This method of lighting, though comparatively cheap, is attended by far too great a risk from fire. The buildings are all equipped with fire hose, couplings, etc., and the military companies are given a sufficient number of fire drills each year to render them fairly efficient as fire companies. But the danger from fire with nearly or quite one hundred kerosene lamps burning for five hours each evening, during several months of the year, is obviously too great a risk for the state to assume. The trustees carry a reasonable insurance on buildings, furniture and apparatus, but a very considerable loss to the state and a very serious interruption to the work of the University would necessarily result in case of fire. It is urgently recommended that an appropriation be made by the next legislature for lighting the University by electricity.

INCIDENTIALS.

There are always numerous calls upon the trustees for expenditures which cannot be specifically enumerated, or, in many cases, anticipated. The whole matter of supplies for the class rooms and dormitories, including postage, stationery, printing, necessary travel on behalf of the University, is a single but important item under this head. To provide for these expenditures an appropriation is always made for incidential expenses. The board has more than once been seriously embarrassed by an inadequate appropriation for this purpose. The sum of $5,000 is respectfully asked on this account for the ensuing two years.

THE LIBRARY.

As has been frequently reported heretofore, the library at the University is small but well selected. It consists of about five thousand volumes, and is an invaluable aid in the work of teaching. Every facility is offered to students to encourage them in habits of original research, and in a taste for good literature; and it is a satisfaction to report that the use of the library is constantly increasing. Such being the case, it is imperative that the library be made as good as possible, that the volumes now on the shelves be kept well bound, that they be replaced when worn out, and that year by year additions be made.

It is very unfortunate that for six years no appropriation has been made for this purpose. Meanwhile the world has gone steadily on. Many new discoveries have been made; many masterpieces have been written; old theories have been exploded; new ideas have been set forth. Scarcely one of the thousands of valuable books which have been published in the last six or seven years has found its way to our shelves. If this continues much longer we shall be more like a medieval university than a modern one. The faculty one and all are endeavoring to keep abreast of the times. They are trying to use modern methods. But good work is impossible if our reference books are out of date, and if on many of the most interesting scientific problems we have no books at all. In our editions of standard authors, too, there are still very discreditable gaps. If the University is going to take the rank to which it is in other respects entitled, its library must be maintained and constant additions must be made.

In view of these facts, the legislature is asked to appropriate the sum of $3,000 for the library. This will make it possible to replace or rebind worn-out volumes now on the shelves, to bring the library up to a reasonable point of efficiency, and to secure more adequate service. When it is remembered that there has been no appropriation whatever since the $3,000 appropriated in 1892, this sum will not seem excessive.

LANGUAGE DEPARTMENT.

At the present time thirty different courses of study are offered in the various language departments of the University. To supplement this work and increase the value of the courses, three things are needful. First, a series of maps and charts. The charts are necessary in historical and philological work, and the maps indispensable not only in these fields, but in the literary field as well. Second, a collection of pictures and casts to illustrate the life and art of foreign lands. More can frequently be learned from a good picture than from a half-hour's lecture. Third, some new books in the library. It must be remembered that what the laboratory is to the scientist, that the library is to the teacher of the humanities. Thither the pupils are sent to investigate; and it is necessary for good work that thre be masterful discussions on all sides of the problems in hand. A good library has always been the heart of a university, the source of its life and power. This is especially true today, when college education no longer means the learning by rote of a few arid text-books, but the acquisition of power by coming in contact with the best that has been thought and said in the world. The general needs of the library have been more definitely set forth elsewhere; but for the specific needs of these departments along the lines suggested above, the sum of $800 is asked. In no other department is so much done to free the student from provincialism, and to enable him to see life steadily and as a whole. The maps, charts, pictures, casts, and books will be incalculably helpful in this work, and the state cannot afford to cripple these departments by withholding the small sum asked.

SCIENTIFIC INVESTIGATIONS.

As a result of investigations carried on in our chemical laboratories during the last three or four years industries looking to the development of North Dakota clays will, with the opening of spring, be started in at least two counties of this state, with a capital of nearly or quite one hundred thousand dollars. The development of North Dakota coals was largely an outgrowth of investigations carried on and results of the same published by Prof. Babcock of our department of Chemistry. Prof. Babcock has for some time been making a special study of the artesian and other water supplies of North Dakota, for the U. S. Geological Survey, and the results of these investigations will soon be published. Bacteriological and chemical analyses of water have come to be a regular and most important feature of the work of our biological and chemical laboratories, and have been largely conducive to an improved sanitary condition in many towns in the state.

I submit herewith reports from the professors in charge of the several departments.

DEPARTMENT OF CHEMISTRY AND GEOLOGY.

To the President of the Board of Trustees:

The work of the department of Chemistry and Geology is twofold, namely, that of instruction and that of investigation. During the past two years instruction has been given in four courses of

Chemistry and in one of Geology and Mineralogy. Those who elect the fourth course of chemistry will have had four years work in this line of study. Most of these classes are required to spend two hours daily in the laboratory. The classes are large, in some cases nearly twice as large as can be accommodated in the laboratory at one time. The instruction begins with elementary chemistry and extends through organic chemistry, qualitative analysis, quantitative analysis, assaying of ores, commercial analysis, analysis of foods and water, techical analysis connected with manufacturing enterprises and orgininal investigations. One of the most encouraging features of the work is the rapid increase in the number of pupils taking the advanced courses, and especially in the fact that several postgraduate students are pursuing work for the second degree. Besides the regular class work, a large amount of scientific investigation is constantly being carried on in this department. The work is of a practical nature and consists for the most part of analyses and value determinations of specimens of various kinds, such as minerals, soils, vegetable products, waters, etc., which have been sent in from various parts of the state. It is not an easy matter to recognize the volume and importance of such work.

Considerable field work has been carried on with a view to the development of the natural resources of the state. Preliminary investigations have been made in such subjects as the growth of sugar beets in this state, the extent and value of the coal deposits, and the rare clays of North Dakota. These investigations have been limited by lack of funds and lack of help in the department.

It is hoped that the legislature will be liberal in its support of this department and thus make it possible to extend these investigations. The increasing demands upon the department of Chemistry and Geology for such work as has been mentioned, and the rapidly increasing number of students seeking advanced courses in Chemistry call for a corresponding increase in rooms, apparatus, and help. The professor in charge has made a faithful effort to do the work of instructing these numerous large classes and at the same time do the large amount of analytical work sent in from over the state and attend to the geological field work. Of course it is impossible under such circumstances to do what should be done. The one attempting this has been fairly overwhelmed. All of this work is of great importance and should be given much more time and attention than it is possible for one man to give. Twenty-four hours per day is not time enough for one man to do the work constantly demanded from this department. The necessary work is accumulating more rapidly than it can be discharged. At least one assistant is imperatively demanded if the work is to be kept up even in the most unsatisfactory style. In many eastern and western schools having a much smaller attendance than this institution the work which is supposed to be done by the head of this department is divided between three or more men. To make the matter worse the laboratory room in this institution is altogether inadequate. Nearly every available foot of floor and wall space has been forced into use and still the classes have been so large that the only possible way to get desk room was to divide the class into two or three sections, causing a large loss to the state and an added burden to the teacher. The average increase in the number of pupils taking work in the department is about 30 per cent per year. But the capacity of the laboratory has now been far exceeded. It is impossible to see how, in the present quarters, it will be possible to provide for farther growth in numbers or in quality of work. Besides this, there are several hundred dollars worth of specimens packed away, the use of which is lost entirely because of lack of room. On account of this lack of space many costly instruments are kept where they come in contact to a greater or less degree with corroding chemicals, which will in a short time ruin them and thus cause a loss of many hundreds of dollars to the state. Again, located as the laboratory is in small rooms in the basement, it becomes impossible to work without frequently filling the rooms and even the entire building with irritating and often very poisonous gases. Finally, the danger of fire to the large building in which the chemical laboratory is situated is of necessity very great. In such a laboratory there must be stored scores of chemical compounds which are either explosive or very readily combustible (some of which ignite or explode vigorously when brought in contact with water and others which burn with equal vigor if allowed to come in contact with dry air). This danger is clearly seen by the number of fires which have originated in the chemical laboratories of many colleges. At the University of Minnesota, for example, at least two or three times have the buildings in which were located the Chemical and Mineralogical laboratories been wholly or partly burned down. During the past summer one of the largest and best managed chemical houses in America was visited by a most destructive fire, caused probably by spontaneous combustion. On account of the conditions just pointed out the absolute necessity of *a science building* at this period in the history of the institution will be apparent as a requisite for growth. The sum of $25,000 should be appropriated for a suitable building in which to place the Biological, Physical, Chemical and School of Mines laboratories and testing rooms. Heretofore there has been too little money available for chemicals and apparatus. Most of the apparatus and many of the chemicals required are costly. A generous equipment is absolutely necessary in order to do good work.

I recommend that the legislature be asked to appropriate as follows for the department of Chemistry, Geology, and Mineralogy.

Laboratory apparatus and repairs	$1,000
Chemicals and chemical apparatus	1,000
Total	$2,000

Respectfully,
E. J. BABCOCK,
Professor in Charge.

SCHOOL OF MINES AND GEOLOGICAL SURVEY.

To the President of the Board of Trustees:

Recognizing the vast importance of the mining industry in some form or other, most of the states of the Union have established mining schools. The importance of these schools has also been recognized by the general government by setting aside a large amount of land for their aid.

Such a school has been located in North Dakota as a department of the University, but owing to the lack of any appropriation, nothing has as yet been done toward operating this department. The time has now come when the interests of the state demand that the work be begun. It is therefore hoped that the present legislature will make a special appropriation sufficient to make a beginning of this department. A large sum is not now asked, but simply enough to organize and commence the work. We believe that once this feature of the University is in operation it will fully show its utility and economic value to the whole state. The work of the department would not be simply in minerals and mining, but would also be in mechanical lines.

The work of instruction would represent but one feature of the department. The School of Mines should also make investigations and demonstrations of all mineral resources of the state. It should provide means for thorough investigation and determination of specimens sent in from all parts of the state. It should be the duty of the department to make a thorough and systematic geological and mineral survey of the entire state, to publish from time to time the results of these investigations, and to assist in every way possible in developing the natural resources of the commonwealth. Such a survey is provided for in most of the states, and has proved itself of great value. It would be especially important in a new state like North Dakota, for it would show the existence and value of resources which would otherwise remain unknown. Those who think North Dakota devoid of all mineral resources have a mistaken notion. This idea comes from the fact that there has been scarcely any thorough scientific research made to reveal these resources. While our state may never appear as a great mining state, yet it possesses some mineral deposits which are almost certain to become extensively used.

Something is known of the vast deposits of lignite coal, but it is surprising how little the immense value of these deposits is appreciated. The region possessing these deposits should be helped to a thorough scientific survey by the School of Mines. In the laboratory of the School of Mines an investigation should be carried on for the purpose of discovering and making known the best and most economical methods of burning these coals.

Beds of rare and very valuable clay have been discovered in the state. From a preliminary investigation which the prefessor of chemistry and geology has made, it seems certain that these are clays of unusual value. There is no reason why a large industry cannot be built upon these resources. If the School of Mines were in operation as suggested, it could give valuable aid in developing these deposits. There are indications that deposits of good building stone may be found in some localities.

All of these are important mineral resources. There may also be others which, through lack of investigation, remain unknown. Enough has been said to show that North Dakota has valuable mineral deposits and that an immediate opening of the mining department of the University, having in charge the Geological and Mineral survey which has already been established by the state, would be of great help in developing these natural resources. Although the federal government has given this state many thousands of acres of land for the School of Mines, in connection with which the state has nominally added a geological survey, still not a cent has been appropriated by the state for either purpose. It has therefore been impossible to gain the advantage we should have from the government grant, nor has it been possible to start the geological survey. Hundreds of inquiries come in from the people of the state but it is impossible to investigate any of these unless done at the expense of the one in charge of this work. Numerous inquiries are received from parties in eastern states regarding various resources which they have thought of developing. Many such questions it is impossible to answer because little geological work has been done. Thus no doubt several important enterprises have been lost to the state. It is not economy to withhold appropriations for work of this sort. Every dollar expended on a geological survey will doubtless bring back to the state several hundred fold. The enormous profit derived by the older states from expenditures on such geological surveys is unquestionable. To cover the traveling expenses and other expenses connected with field work and the publication and distribution of reports of resources, an appropriation of $1,900 is asked for the period of two years.

In order to start the testing department of the School of Mines so as to render available the land grant from the United States government, an appropriation from the state of $3,800 is asked to fit up laboratory, furnace and testing room.

Very respectfully,
E. J. BABCOCK,
Director of the School of Mines and Geological Survey.

DEPARTMENT OF PHYSICS.

To the President of the Board of Trustees:

In this report I wish especially to call attention to the need of a science building. At present the department of physics has only two rooms, and this is not sufficient for the work to be caried on properly. At least three times as many rooms are needed. There ought to be a lecture and recitation room, an apparatus room, a dynamo room and workshop, a room for elementary laboratory work, a room for spectrometer and photometric work, and one or two rooms for advanced laboratory work. Should this University be compared with other similar institutions, I should have to ask for twice the number of rooms I have here mentioned. Being thoroughly convinced that a liberal appropriation for the erection of a science hall at the University will benefit the state, I respectfully recommend that the legislature be asked to appropriate at least $25,000 for this purpose.

The department is also in great need of a number of expensive pieces of apparatus. Among these may be mentioned a dynamo with some power to run it, a lantern suitable for physical experiments, ammeters, voltmeter, a dividing engine, Kater's pendulum, cathetometer, induction coil, galvanometer, thermopile, etc. In order that these needs may be reasonably satisfied I recommend that the following appropriation be made by the legislature:

For Physical and Astronomical apparatus.... ....$2,000

Respectfully,
CARL J. ROLLEFSON.

DEPARTMENT OF BIOLOGY.

To the President of the Board of Trustees:

In every University the department of Biology has a two-fold purpose, the giving of instruction and the prosecution of research. Both objects are to be attained in commensurate proportion to the scope of work outlined, the number and efficiency of workers engaged, and the appliances and equipments at their disposal.

In the department of biology in the North Dakota State University a course of instruction in animal and vegetable biology is so arranged that the student gains a comprehensive conception of the structure and physiology of typical forms in a progressive series from the lowest to the highest animals and plants. In advanced biology, the students intending to enter different professions are directed to subjects particularly pertinent to their contemplated course of study; for example, those expecting to study medicine are especially instructed in the nature and identification of bacteria, which cause all contagious and infectious diseases, also in the methods of securing immunity from the various bacterial forms.

Those who intend to farm are directed to the adaptation of plants to climate and soil, the relative value of forage grasses and the needs of forest cultivation and preservation. The subject of weeds and their relation to crops is one that is thoroughly impressed upon the minds of prospective agriculturists. The basis of this specialization is secured in thorough but less advanced courses of study required of all students.

The research work of the department is conducted with reference to economic and scientific results. An endeavor is being made to determine the distribution and economic value of various forage plants, to gain a knowledge of the character and vitality of certain weeds and how to exterminate them; to identify the organic forms in water supplies and to observe their physiological effects upon different animals.

This instructional and experimental work suffers greatly for lack of sufficient room. Often students of three different classes are working in the same laboratory, equipped for one class only It is perfectly clear that students as well as professional men must have adequate apartments for the special study of their subjects in order to secure the most satisfactory results.

The present biological accommodations are sufficient for twenty students, but it has become necessary to arrange for twice this number during the same hours every day. This overcrowded condition almost precludes first class work in the laboratory and tends to develop a decided dislike for laboratory subjects in the minds of earnest students. The urgent need of a science hall has become so obvious that the most casual visitor to the State University remarks, "Has this state no interest in her chief educational institution and in its scientific work? If so, why are you not provided with rooms commensurate with the attendance?" This demand for a science hall should receive immediate attention. It would not cost over $25,000 and would give abundant room for all of the science departments and make provision for that rapid growth enjoyed by this institution heretofore. If the state grants this appropriation and relieves the present congested condition of the science departments she will receive benefits that can accrue only from a judiciously equipped institution of learning and research. She cannot afford to fall behind neighboring states in this line of educational work.

As the standard of instruction improves the requests for advanced work becomes more numerous. These demands cannot be met by the department satisfactorily without proper equipments. If this branch of college work is to grow and attain any considerable success, equipments in apparatus, reagents and laboratory material should be provided. Therefore to satisfy partially the needs of the Biological department I respectfully suggest that an appropriation of $3,500 be made by the state legislature, this appropriation to be divided and used as follows:

For apparatus and fixtures	$1,000
Reagents	500
Laboratory material	500
Total	$2,000

Respectfully,
MELVIN A. BRANNON.

THE MUSEUM.

To the President of the Board of Trustees:

One of the growing demands in North Dakota is a safe depository for a complete and representative collection of her native resources, botanical, zoological and geological. This demand is increasing for two reasons; the first is, that many of the living and fossil organic forms are disappearing, the former being exterminated by adverse conditions and the latter disintegrated with continued exposure or being discovered and appropriated by outside investigators; the second reason is that, were these specimens collected and rightly classified, they would afford invaluable means of education of the student of this and adjoining states To illustrate the value of museums in educational work one must remember that the natural history of a country is represented by it's animals and plants; that ancestral forms are represented only by fossils, many being found in great abundance in the geological deposits of this state; that the forms of today are subject to the same laws their ancestors were and with changing conditions some will survive while others will be exterminated by incoming forms; and that in no other way can these lessons be so clearly taught as by a collection and classification of the organisms themselves. These specimens will furnish the facts and data regarding the favorable and unfavorable conditions which prescribe certain limits to living matter everywhere, and afford the proper material for laboratory study of physiological laws and economic value of plants and animals.

An endeavor has been made, in the development of the museum at the State University, which, so far as known, is the only state museum in North Dakota, to make collections of native resources and utilize them for educational purposes rather than for side shows or mere attractions to those who pine for amusement. An attempt is being made to gather the representative clays, coals and fossils from various portions of the state, to collect and preserve the typical animals of North Dakota, many of which are almost extinct, and also to secure a botanical collection which shall be most instructive to our students in the study of crops and forage grasses.

This collection cannot be made without proper assistance and equipment, but if these are provided the State University Museum can be greatly enlarged and made correspondingly more valuable as an educational depository of the representative geological, zoological and botanical possessions of the state. Not only will it be a means of great efficiency in promoting the educational interests of the state, but it will be very instrumental in publishing her rich and varied resources to the world. Therefore I beg to recommend that the next legislature appropriate $2,000 to further presecute the work of collection and identification of the almost unknown mineral, animal and plant resources of this state.

Respectfully,
M. A. BRANNON, Curator.

MILITARY DEPARTMENT.

A military department, co-ordinate with the departments of Arts, Science, and the Normal department, was created by the organic act establishing the University. Military instruction is imparted by drills, military gymnastics, recitations and lectures. The course in this department covers four years and is required of all male students, unless especially excused by the faculty. The federal government details an officer of the regular army to serve as professor of Military Science and Tactics at the University. The war departments loans the University ninety cadet rifles and accoutrements, cavalry sabres, belts, swords, etc., and supplies, free of charge, ammunition for target practice. In return the government requires the University to furnish free quarters to the commandant. In the absence of suitable quarters at the University the last legislature appropriated seven hundred and twenty dollars ($720) for two years as commutation of quarters for the military instructor. The same sum should be appropriated for the ensuing two years. The University cadets, it is believed, constitute by far the best drilled and most efficient body of citizen soldiers in the state. In case of invasion or civil uprising they would be in a position to render the state invaluable service as commissioned and non-commissioned officers for the state militia and volunteers. The state gains more than value received for the small expense entailed by the military department.

A drill hall, costing $2,000, is urgently needed for the use of the military department. At present the drills during the winter months are conducted in the narrow halls of the main building, which are entirely unsuited to the purpose. Hardly any marching is possible and company and battalion formations are out of the question. The military department has been maintained at the University under great difficulties for the past fourteen years. The inspector-general, in his annual inspection of the cadets, has more than once insisted that the University make more suitable provision for our military department as a condition of the general government maintaining a detailed officer at the University.

NEW DORMITORY.

The University has outgrown its present quarters. We need a new science hall; we need larger quarters for our library and reading room; above all, we need a new dormitory. At this writing every room in the dormitories is full. Judging from other years, our attendance during the winter term will be larger by from 50 to 75 students than it is at present. All these students will have to find quarters in Grand Forks, two and one-half miles distant. It is almost impossible to secure comfortable accommodations in Grand Forks, during the winter, on terms which students can afford to pay. In inclement weather it is impossible for young ladies to walk between town and University, and to ride each way, even if there were facilities for riding, as there are not, would swell the expense of attending the University beyond the ability of most students to meet it. An additional dormitory costing say $25,000 is most urgently needed and absolutely indispensable if the University is to continue to grow.

INSTRUCTIONAL FORCE.

The faculty of the University numbers twelve members, the departments of Mathematics and Physics being for the present combined with that of Scandinavian Languages and Literatures. During the biennial period 1895-97, in the absence of an appropriation by the state, it became necessary to dispense temporarily with the chairs of English and of Scandinavian, owing to the resignation of the occupants of those chairs. A part of the work in English was carried temporarily by instructors in other departments, the rest being postponed till funds should be available for employing an instructor in that department. The work in Scandinavian was discontinued altogether. In the appropriation of two years ago no provision was made for these vacancies, although the work in these departments had accumulated during the previous two years and further postponement was out of the question. No department in the University is more important than that of English, and a professor of English was accordingly secured as soon as the new appropriation became available. The law specifically provides for the teaching of Scandinavian at the University and the employment of a professor in that department. The employment of these two men, for whom no provision was made in the last appropriation, has necessitated a deficiency, in the account of instructional force, of $5,000. Our faculty is an exceptionally able one for so young an institution. The salaries paid here are under, rather than over, those paid to men of the same ability and training in other institutions. To pay for the next two years the same rate of salary which has been maintained for the last fourteen years, and in consideration of which our instructors were induced to come to us, will require an appropriation of $46,720. To reduce salaries now would be a distinct act of bad faith toward these men. Our enrollment has now become so large that many classes have to be divided, our recitation rooms being too small to accommodate many of these classes. Such a division, of course, duplicates the work of instruction and makes so much heavier demands upon the time and strength of the instructors. Many of our instructors are already teaching twice the number of hours daily that are required of instructors in most institutions. No institution of learning can afford to make of its professors mere hacks, without time or strength for study and investigation. The surest way to fossilize an institution of learning is to fossilize its professors by making them mere class-room drudges.

Our faculty today is smaller than it was six years ago when the attendance was little more than half what it is now. The high shools of the state are constantly increasing the number of their instructors to meet the demands of an increasing attendance, while the State University, the natural leader of these schools, is at a stand still. At least two additional instructors must be employed next year if the University is to maintain the high standard of instruction which has prevailed heretofore. The sum of $50,000 is urgently needed for salaries for the next two years. I need not remind you that it is the faculty that makes an institution of learning. To employ men of inferior ability or training because they can be gotten cheap would be economy of the same sort and degree as putting rotten timbers into a building because they are cheaper than sound ones. Our instructors are already receiving less than half—in many cases less than one-fourth—the income generally received in this state by men of the same ability, training and experience in either law or medicine, and considerably less than any good farmer receives, on the average, from farming land representing a money investment corresponding to that which our professors have put into the work of special preparation for their profession. If it be urged that North Dakota is a young and, as yet, comparatively poor state, and cannot afford to pay her university professors such salaries as prevail in older and richer states, it may be urged in reply that we pay—and wisely so—our judges, legislators and executive officers larger salaries than many states which pay their State University professors far larger salaries than we. If the higher education is to be a discredited thing in North Dakota how long shall we continue to have a judiciary which ranks among the ablest in the country? It is not urged that the salaries of our professors be raised, but a protest is intended to be made against the disposition manifested at the last session of the legislature to reduce the salaries which had prevailed since the University was founded. We should resent the imputation that, because North Dakota is young and comparatively poor, therefore she does not need an able judiciary nor a wise legislature. We ought equally to resent the imputation that, for these same reasons, the youth of North Dakota can get along with inferior instruction and an antiquated scholarship—which they would do if the salaries of the University professors were to be made lower than those received by many a bank or store clerk. In conclusion I beg to renew my plea of two years ago for

FIXED APPROPRIATIONS.

Many, if not most, states supporting a state university have substituted for the regular annual or biennial appropriation a permanent appropriation of a fraction of a mill on the assessed valuation of the state. Such an arrangement has much to recommend it, both from the point of view of the state and the university. It would put an end once for all to the unseemly higgling which takes place at each biennial session between the state and its leading educational institution, with the imputation on the one side that the institution is engaged in a raid upon the state treasury, and the ill-suppressed feeling on the other that the state cares nothing for education and begrudges every penny spent in its support. Every argument for fixed salaries in the case of state officials is valid for fixed salaries for professors in the State University. So great are the advantages of a permanent faculty in an institution of higher learning that a call to a professorship in any college or university in any part of the world is understood to be a call to a permanent position, and it has been held that an attempt on the part of a board of trustees to terminate such an implied contract, except for cause, would be actionable at common law. Good men will not be attracted to the faculty where doubt exists as to the permanency of the salary offered, and even to the permanency of the institution itself. Men coming to the faculty of such an institution will invariably insure the risk attending the insecurity of salary or position by demanding a larger salary, and the institution will invariably pay the premium on this risk, either by the payment of larger salaries, or by having to put up with inferior men. It is greatly to be desired that a committee of the most intelligent members of the two houses of the coming legislature be appointed to make a searching investigation of the needs of the University, economically administered, and be empowered to recommend a fixed tax rate, based upon the assessed valuation of the state, the income from which shall be permanently devoted to the maintenance of the University. As the state increases in wealth the assessed valuation will naturally increase, and it is to be presumed that the institution will grow and its needs increase in about the same ratio.

Respectfully submitted,

DAVID BARTLETT,

President Board of Trustees.

FINANCIAL REPORT OF STATE UNIVERSITY, FROM SEPTEMBER 15, 1896.

	Cash on hand Sept. 15, 1896.	Received by Appropriation, 1897.	Received from other sources (rent and home fees).	* Balance on hand July 1, 1898.	Balance on hand December 1, 1898, when bills to that date shall have been paid by the State.	March 1, 1899.
Instruction		$ 35,000.00	$	$ 8,558.24	$ 275.07	Deficient nearly three months.
Biology		500.00		101.62	73.82	
Mathematics and Physics		500.00		281.26	194.91	
Chem., Geology and Min.		500.00		55.37		
Repairs		2,000.00		292.89		Bill outstanding for necessary repairs.
Fuel and lights		6,000.00		598.50		
Engineer and assistant	649.98	3,000.00		1,266.72	503.43	
Water		1,000.00		127.55	127.55	
Incidental		1,000.00	† 276.15 101.49 323.36 21.16	.82	323.36	
Com. Quarters		720.00		240.00	90.00	
Military		500.00		313.70	64.63	
Deficiency		8,500.00		1.03		
Library						
Museum						
School of Mines			135.42		75.34	
Home Incidental			3,914.80 5,072.44 2,100.00	1,359.13	1,355.85	

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* At this date December 2, expenses not yet paid by the State after July 1.

† Credited to Incidental Fund.

List of Orders Issued.

List of orders issued by the accounting officer since last report, September 15, 1896.

	No. or Order.	Amount.
J. Guyot	1785	$108 33
J. Guyot	6	108 33
J. Guyot	7	108 33
J. O'Leary	8	276 15
J. Guyot	9	108 33
J. Guyot	90	108 33
J. Guyot	1	108 33
W. Merrifield	2	1,041 65
J. Macnie	3	833 30
H. B. Woodworth	4	833 30
L. Estes	5	833 30
E. J. Babcock	6	833 30
Joseph Kennedy	7	833 30
Geo. S. Thomas	8	833 30
M. A. Brannon	9	833 30
Mrs. H. E. Davis	1800	555 55
G. St. J. Perrott	1	500 00
C. S. Farnsworth	2	375 00
W. L. Nuessle	3	56 00
Eimer & Amend	4	100 00
W. Merrifield	5	416 66
J. Macnie	6	333 32
H. B. Woodworth	7	333 32
L. Estes	8	333 32
E. J. Babcock	9	333 32
Joseph Kenedy	10	333 32
Geo. S. Thomas	1	333 32
M. A. Brannon	2	333 32
Mrs. H. E. Davis	1813	222 22
G. St. J. Perrott	4	200 00
C. S. Farnsworth	5	90 00
S. Skulason	6	10 00
C. S. Farnsworth	7	60 00
J. Guyot	8	216 66
Noyes Bros. & Cutler	9	30 57
Eimer & Amend	20	54 96
Marine Bio. Lab	1	34 45
Bansch & Lomb Opt'l Co	2	124 52
Gr. Forks Lumber Co	3	7 35
Josie Kildahl	4	5 05
B. O. Paulness	5	86 27
Gr. Forks Lumber Co	6	42 10
W. A. Wilkinson	7	9 05
The Am. Naturalist	8	4 00
A. C. McClurg & Co	9	43 80
O. Young	30	39 45
Trepanier & Co	1	30 90
H. Tharaldson	2	104 38
N. W. Tel. Exch. Co	3	15 00
W. Merrifield	4	208 33
John Macnie	5	166 66
H. B. Woodworth	6	166 66
L. Estes	7	166 66
E. J. Babcock	8	166 66
Joseph Kennedy	9	166 66

Geo. S. Thomas	40	166 66
M.A.Brannon	1841	166 66
Mrs. H. E. Davis	2	111 11
G. St. J. Perrott	3	100 00
C. S. Farnesworth	4	45 00
S. Skulason	5	25 00
W. Nuessle	6	24 00
C. S. Farnsworth	7	30 00
J. Guyot	8	108 33
N. W. Tel. Exch. Co	9	3 00
Gr. Forks Music House	50	72 00
Wm. Burford	1	24 00
Gr. Forks Herald	2	231 75
R. B. Griffiith	3	82 18
Gr. Forks Plaindealer	4	13 75
Jos. Kennedy	5	16 66
Peter Gunderson	6	1,440 00
John O'Leary	7	300 00
Bansch & Lomb Opt'l Co	8	8 03
R. B. Griffiith	9	83
Wm. Hoskins & Co	1	6 00
Iler & Co	60	18 92
A. C. McClurg & Co.	2	9 00
W. Merrifield	3	208 33
H. B. Woodworth	4	166 66
John Macnie	5	166 66
L. Estes	6	166 66
E. J. Babcock	7	166 66
Joseph Kennedy	8	166 66
M. A. Brannon	1869	166 66
Mrs. H. E. Davis	70	111 11
G. St. J. Perrott	1	100 00
C. S. Farnsworth	2	75 00
Joseph Kennedy	3	16 66
W. Merrifield	4	208 33
H. B. Woodworth	5	166 66
John Macnie	6	166 66
L. Estes	7	166 66
E. J. Babcock	8	166 66
Joseph Kennedy	9	166 66
M. A. Brannon	80	166 66
G. St. J. Perrott	1	100 00
C. S. Farnsworth	2	30 00
Joseph Kennedy	3	16 66
Metropolitan Theatre	4	25 00
Hall & Gallup	5	38 75
O. Young	6	73 50
N. W. Tel. Exch. Co	7	6 00
Luke & Barnes	8	76 42
Trepanier & Co	9	67 45
R. B. Griffith	90	49 72
Elliot & Tovey	1	197 20
Red River Lumber Co	2	86 96
M. J. Moran	3	555 00
J. B. Mooney	4	450 00
Gr. Forks Lumber Co	5	49 63
W. A. Wilkinson	6	6 00

Worden Bros.	1897	600 00
Stephen Collins	8	18 50
Funk & Wagnalls	9	9 00
Jos. A. Guyot	1900	216 66
Geo. S. Thomas	1	333 33
W. Merrifield	2	208 33
H. B. Woodworth	3	166 66
John Macnie	4	166 66
L. Estes	5	166 66
E. J. Babcock	6	166 66
Joseph Kennedy	7	166 66
Geo. S. Thomas	8	166 66
M. A. Brannon	9	166 66
G. St. J. Perrott	10	100 00
Vernon P. Squires	1	200 00
C. S. Farnsworth	2	30 00
Jos. Guyot	3	108 33
Joseph Kennedy	4	16 66
O. Young	5	39 45
N. W. Tel. Exch. Co.	6	3 00
Gr. Forks Plaindealer	7	10 00
J. B. Mooney	8	38 00
M. J. Moran	9	55 00
W. Merrifield	20	208 33
H. B. Woodworth	1	166 66
John Macnie	2	166 66
L. Estes	3	166 66
E. J. Babcock	4	166 66
Joseph Kennedy	1925	166 66
Geo. S. Thomas	6	166 66
M. A. Brannon	7	166 66
G. St. J. Perrott	8	100 00
Vernon P. Squires	9	100 00
C. S. Farnsworth	30	30 00
Jos. A. Guyot	1	108 33
Joseph Kennedy	2	16 66
Noyes Bros. & Cutler	3	11 00
Josie Kildahl	4	6 40
W. A. Wilkinson	5	15 90
Eimer & Amend	6	125 60
Noyes Bros & Cutler	7	11 43
W. A. Wilkinson	8	30 00
Gr. Forks Herald	9	36 45
W. Merrifield	40	208 33
H. B. Woodworth	1	166 66
John Macnie	2	166 66
L. Estes	3	166 66
E. J. Babcock	4	166 66
Joseph Kennedy	5	166 66
Geo. S. Thomas	6	166 66
M. A. Brannon	7	166 66
Vernon P. Squires	8	100 00
G. St. J. Perrott	9	100 00
Mrs. H. E. Davis	50	111 11
May H. Cravath	1	45 00
Jos. A. Guyot	2	108 33
Joseph Kennedy	1953	16 66
John R. Selby	4	30 00

James Turner	5	332 04
J. B. Mooney	6	7 10
B. O. Paulsness	7	52 70
B. O. Paulsness	8	33 30
Detroit Heat. & Lt. Co.	9	25 00
Stephen Collins	60	3 94
Eimer & Amend	1	30 49
Bausch & Lomb Opt'l Co.	2	30 41
Detroit Heat. & Lt. Co.	3	19 36
L. Estes	4	70
Detroit Heat. & Lt. Co.	5	148 50
Detroit Heat. & Lt. Co.	6	36 40
Emier & Amend	7	25 75
B. O. Paulsness	8	141 63
W. Merrifield	9	208 33
H. B. Woodworth	70	166 66
John Macnie	1	166 66
L. Estes	2	166 66
E. J. Babcock	3	166 66
Joseph Kennedy	4	166 66
Geo. S. Thomas	5	166 66
M. A. Brannon	6	166 66
Geo. St. J. Perrott	7	100 00
Vernon P. Squires	8	100 00
Mrs. H. E. Davis	9	111 11
May H. Cravath	80	45 00
Joseph Guyot	1	108 33
Joseph Kennedy	1982	16 66
John R. Selby	3	30 00
Peter Gunderson	4	41 63
Stephen Collins	5	17 10
James Turner	6	10 35
W. Merrifield	7	208 33
H. B. Woodworth	8	166 66
John Macnie	9	166 66
L. Estes	90	166 66
E.J.Babcock	1	166 66
Joseph Kennedy	2	166 66
Geo. S. Thomas	3	166 66
M. A. Brannon	4	166 66
G. St. J. Perrott	5	100 00
Vernon P. Squires	6	100 00
Mrs. H. E. Davis	7	111 11
May H. Cravath	8	45 00
Jos. A. Guyot	9	108 33
John R. Selby	2000	30 00
American Book Co.	1	24 00
W. Merrifield	2	208 33
H. B. Woodworth	3	166 66
John Macnie	4	166 66
L. Estes	5	166 66
E. J. Babcock	6	166 66
Joseph Kennedy	7	166 66
Geo. S. Thomas	8	166 66
M. A. Brannon	9	166 66
G. St. J. Perrott	2010	100 00
Vernon P. Squires	1	100 00
Mrs. H. E. Davis	2	111 11
May H. Cravath	3	60 00

Joseph Guyot	4	108 33
John R. Selby	5	30 00
Worden Bros. and Miss Worden	6	150 00
Bausch & Lomb Opt'l Co	7	5 67
W. Merrifield	8	208 33
H. B. Woodworth	9	166 66
John Macnie	20	166 66
L. Estes	1	166 66
E. J. Babcock	2	166 66
Joseph Kennedy	3	166 66
Geo. S. Thomas	4	166 66
M. A. Brannon	5	166 66
G. St. J. Perrott	6	100 00
Vernon P. Squires	7	100 00
Mrs. H. E. Davis	8	111 11
May H. Cravath	9	60 00
Jos. A. Guyot	30	108 33
Frank H. Albright	1	30 00
Daniel Dow	2	27 90
Eimer & Amend	3	39 68
L. Estes	4	5 51
A. C. McClurg & Co	5	3 75
Stephen Collins	6	13 50
Gr. Forks Herald	7	20 00
W. Merrifield	2038	208 33
H. B. Woodworth	9	166 66
John Macnie	40	166 66
E. J. Babcock	1	166 66
Joseph Kennedy	2	166 66
Geo. S. Thomas	3	166 66
M. A. Brannon	4	166 66
G. St. J. Perrott	5	100 00
Vernon P. Squires	6	100 00
Mrs. H. E. Davis	7	111 11
May H. Cravath	8	60 00
Frank H. Albright	9	30 00
Jos. A. Guyot	50	108 33
Eimer & Amend	1	26 96
Bausch & Lomb Opt'l Co	2	1 12
Mrs. Belle Estes	3	44 54
James Turner	4	2 40
W. Merrifield	5	208 33
H. B. Woodworth	6	166 66
John Macnie	7	166 66
E. J. Babcock	8	166 66
Joseph Kennedy	9	166 66
Geo. S. Thomas	60	166 66
M. A. Brannon	1	166 66
Vernon P. Squires	2	100 00
G. St. J. Perrott	3	100 00
Estate of Mrs. H. E. Davis	4	43 62
May H. Cravath	5	60 00
Frank H. Albright	2066	30 00
Jos. A. Guyot	7	108 33
A. F. Turner	8	1,000 00
A. F. Turner	9	500 00
City of Grand Forks	70	275 00
W. Merrifield	1	208 33
H. B. Woodworth	2	166 66

John Macnie	3	166 66
E. J. Babcock	4	166 66
Joseph Kennedy	5	166 66
Geo. S. Thomas	6	166 66
M. A. Brannon	7	166 66
G. St. J. Perrott	8	100 00
Vernon P. Squires	9	100 00
C. J. Rollefson	80	125 00
C. J. Rollefson	1	125 00
May H. Cravath	2	105 00
A. E. Morrison	3	30 00
Jos. A. Guyot	4	108 33
Gr. Forks Herald	5	26 00
Oliver Rynning	6	1,200 00
B. O. Paulsness	7	4 15
Josie Kildahl	8	8 75
W. Merrifield	9	208 33
H. B. Woodworth	90	166 66
John Macnie	1	166 66
E. J. Babcock	2	166 66
Joseph Kennedy	3	166 66
Geo. S. Thomas	2094	166 66
M. A. Brannon	5	166 66
Vernon P. Squires	6	100 00
G. St. J. Perrott	7	100 00
C. J. Rollefson	8	125 00
May H. Cravath	9	60 00
Jos. A. Guyot	2100	108 33
A. E. Morrison	1	30 00
B. O. Paulsness	2	97 45
James Ryan	3	174 00
A. C. McClurg & Co.	4	48 00

Vouchers and expense lists for July, August, September, October and November, aggregating $7,615.15, have been duly sent in to the state but are still unpaid.

REQUIREMENTS.

The following amounts are required for the maintenance of the University of North Dakota for the ensuing two years and for permanent improvements:

Salaries of president and instructional force	$50,000
For department of Biology	2,000
For department of Mathematics, Physics and Astronomy	2,000
For department of Chemistry and Geology	2,000
For Museum	1,000
For Military department and drill hall	3,000
For department of Languages	800
For the Library	3,000
For repairs to buildings and grounds	5,000
For fuel and lights	7,000
For incidentals	5,000
For commutation of quarters for Military instructor	720
For salary of secretary of board	600
For engineer, janitors, etc	4,000
For water rent and repairs to water mains	2,000
For electric light plant and boiler house	3,000
For Artesian well	1,000
For School of Mines	3,800
For Dormitory	25,000
For Law department	5,000
Registrar and librarian	1,200
	$127,120

For deficiency on account of repairs and salaries ....$ 11,506.21

UNIVERSITY OF ILLINOIS

PRESIDENT'S OFFICE

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SIXTH BIENNIAL REPORT

OF THE

PRESIDENT OF THE BOARD OF TRUSTEES

OF THE

UNIVERSITY OF NORTH DAKOTA

TO THE

GOVERNOR OF NORTH DAKOTA

1900

~~UNIVERSITY~~ OF ILLINOIS
PRESIDENT'S OFFICE.

GRAND FORKS, N. D.
HERALD, STATE PRINTERS AND BINDERS
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BOARD OF TRUSTEES.

	Term Expires
Hon. David Bartlett, Cooperstown	1903
Hon. William Budge, Grand Forks	1903
Hon. Stephen Collins, Grand Forks	1901
Hon. H. T. Helgesen, Milton	1901
Hon. William McBride, St. Thomas	1901

OFFICERS OF THE BOARD.

Hon. David Bartlett, Cooperstown	President
Andrew E. Morrison, University	Secretary
S. S. Titus, Grand Forks	Treasurer

COMMITTEES OF THE BOARD.

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William Budge Stephen Collins H. T. Helgesen

LIBRARY, COURSES OF STUDY, TEXT BOOKS.

William McBride H. T. Helgesen Stephen Collins

MUSEUM.

Stephen Collins William McBride William Budge

FACULTY AND INSTRUCTORS.

Department of Arts and Sciences.

WEBSTER MERRIFIELD, M. A., President,
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HORACE B. WOODWORTH, B. A.,
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JOHN MACNIE, M. A.,
Professor of French and German, and Secretary of the Faculty.

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Professor of Chemistry and Geology, State Geologist and Director of the School of Mines.

JOSEPH KENNEDY, B. S., Principal Normal Departments.
Professor of Logic, Psychology and Pedagogy.

GEORGE S. THOMAS, M. A., Ph. D.,
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MELVIN A. BRANNON, M. A.,
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CAPTAIN EDGAR C. BOWEN. U. S. A.,
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GEORGE ST. JOHN PERROTT, B. A.,
Assistant Professor of Laain and Greek.

CARL J. ROLLEFSON, B. A.,
Assistant Professor of Mathematics and Physics; in Charge of the Scandinavian Languages and Literatures.

EMILY K. REYNOLDS, B. A.,
Assistant Professor of English Literature, and Preceptress.

ELWYN F. CHANDLER, M. A.,
Instructor in Mathematics.

ETHLYN F. WILCOX, B. L.,
Instructor in Music, Drawing and Physical Culture.

ELIZABETH M. BRATT,
Librarian and Instructor in Commercial Branches.

WM. L. NUESSLE, B. A.,
Instructor in Civics and Economics.

Department of Law.

HON. GUY C. H. CORLISS,
Dean and Professor of Torts and Private International Law.

JOHN E. BLAIR, B. A., LL. B.,
Professor of the Law of Property, Contracts and Equity, and Secretary of the Faculty.

HON. J. M. COCHRANE, LL. B.,
Professor of Criminal Law and Constitutional Law.

HON. TRACY R. BANGS,
Professor of the Law of Evidence and Agency.

B. G. SKULASON,, B. A.,
Professor of Sales and Carriers.

GEORGE A. BANGS,
Professor of the Law of Corporations.

HON. C. J. FISK,
Lecturer on Bills, Notes and Checks.

F. B. FEETHAM,
Lecturer on North Dakota Practice.

SPECIAL LECTURERS.

HON. CHAS. S. AMIDON, B. A.,
Lecturer on Equity.

HON. J. M. BARTHOLOMEW,
Lcturer on Constitutional Law.

HON. N. C. YOUNG, M. A., LL. B.,
Lecturer on Partnerships.

HON. W. S. LAUDER,
Lecturer on Insurance.

HON. C. A. POLLOCK, M. A., LL. B.,
Lecturer on Property.

HON. D. E. MORGAN,
Lecturer on Extraordinary Legal Remedies.

HON. O. E. SAUTER, LL. B.,
Lecturer on Agency, Bills and Notes.

J. H. BOSARD,
Lecturer on Juries and Jury Trials.

HON. W. H. STANDISH,
Lecturer on Constitutional Law.

REPORT.

Hon. F. B. Fancher,
Governor of North Dakota.

Dear Sir: I have the honor to present herewith the report of the Board of Trustees of the University of North Dakota for the biennial period ending Dec. 31, 1900.

It is a pleasure to be able to report that the period covered by this report has been the most prosperous in the history of the University. The health and discipline of the institution during the period covered since my last report have been excellent. The courses of study in all departments have been thoroughly revised and greatly strengthened, and the requirements for admission to the several departments have been materially increased. With the beginning of the last college year the Department of Law was formally opened for the reception of students, with the Hon. Guy C. H. Corliss as Dean, assisted by four regular instructors, three of them members of the Grand Forks county bar, and several lecturers, mainly judges of the several courts of this state. For the present, the course of study will cover two years. It was thought advisable in opening the school to offer only the first year's course of study. During the present school year both courses are offered and at its close a class will be graduated from the department. The attendance in this department during the year just closing has been twenty-five students, representing widely different sections of the state. With the exception of the secretary, the several instructors have given their services free of charge. It is proposed the ensuing year to pay the instructors a small sum for each lecture delivered, but much less than would be considered a fair equivalent for the work performed. The Board of Trustees feel under great obligations to the gentlemen who have consented to carry on the work of the department either for no compensation or for a compensation far below the real value of the services rendered to the University.

DEPARTMENT OR ARTS AND SCIENCES.

The attendance in this department during the past year has been the largest in the history of the University, numbering 369 students, about one-third of whom have been college students in full standing. More than half of the members of each entering class now come to us from the High Schools of the State. Under the present High School law all High Schools of the First Class fully prepare their students for admission to the Freshman class at the State University. At present twelve High Schools in the state are classified as High Schools of the first class, and most of these schools send yearly one or more students to our Freshman class.

The faculty of the Department of Arts and Sciences consists of fifteen members, including the President. Of these eight are full professors, three are assistant professors and four are instructors. For the present it is found necessary to maintain a Preparatory Department. The studies in this department are so arranged that they may be completed in three years or in four years; those students maintaining a certain standing being allowed to take four subjects each year and completing the course in three years, while those falling below this standard are limited to three studies each year and are compelled to take four years for completing the work of the Preparatory Department. The work of instruction in the Preparatory Department has been carried on during the past year by two instructors who have given their entire time to the department and by eight professors who have given one hour or more daily to this department. I append, in tabular form, the course of study in each of the several departments named. In addition to the prescribed courses provided in the above outline the University offers nearly fifty elective courses.

Fourteen students were graduated from the College of Arts and Sciences at the last Commencement with the degree of Bachelor of Arts, eleven were graduated from the Normal Department, and two from the Graduate Department with the degree of Master of Arts.

THE NORMAL DEPARTMENT.

A Normal Department is maintained at the University under the terms of the charter of the Territorial Assembly in 1883, confirmed by constitutional provision in 1889.

About one-third of all the students enrolled at the University are in the Normal Department, with the *bona fide* intention of preparing themselves for teaching.

The course of study in the Normal Department is a broad and deep one. It requires five years after the common, or grammar school course, and is one year longer than in other Normal Schools of the state. By a recent conference, graduates from the other Normal Schools may enter the sophomore year in the College of Arts at the University, while graduates of the Normal Department or Normal College here, are prepared to enter the junior year of the College of Arts.

The Normal Department costs the state practically nothing, for in all *academic* subjects the Normal students join classes already formed, while in professional subjects they come under the instruction of the Department of Pedagogy, which in all modern universities is a co-ordinate and essential department.

The aim of the Normal Department is to prepare teachers for the higher grades and for high schools throughout the state.

THE WORK OF THE SCIENCE DEPARTMENTS.

I submit herewith reports from the heads of the several Science Departments setting forth the work done in these departments, their needs, etc.

DEPARTMENT OF BIOLOGY.

GRAND FORKS, N. D., Oct. 31, 1900.

To the President of the Board of Trustees:

In every State University the Department of Biology has a twofold purpose, the giving of instruction and the prosecution of research. Both objects are to be attained in commensurate proportion to the scope of work outlined, the number and efficiency of workers engaged, and the appliances and equipments at their disposal.

In the Department of Biology in the North Dakota State University the course of instruction in animal and vegetable biology is so arranged that the students gain a comprehensive conception of the structure and physiology of typical forms in a progressive series from the lowest to the highest animals and plants. In advanced biology, the students intending to enter different professions are directed to subjects particularly pertinent to their contemplated course of study; for example, those expecting to study medicine are especially instructed in animal physiology, histology, and bacteriology. Those who intend to farm are directed to the adaptation of plants to climate and soil, the relative value of forage grasses and the needs of forest cultivation and preservation. The subject of weeds and their relation to crops is one that is thoroughly impressed upon the minds of prospective agriculturists. The basis of this specialization is secured in thorough but less advanced courses of study required of all science students.

The research work of the department is conducted with reference to economic and scientific results. An endeavor is being made to determine the distribution and economic value of various forage plants, to gain a knowledge of the character and vitality of certain weeds and how to exterminate them; to identify the organic forms in water supplies and to observe their physiological effects upon different animals.

In accordance with the demands of modern biology the study of cytological physiology rather than anatomy, is emphasized. Development of work in this direction requires much apparatus and material, and these in turn require additional room.

Physiological experiments require electrical and recording apparatus and many delicate and expensive instruments. This equipment is necessary if a student is to gain any concrete knowledge of respiration, circulation, contractility and other physiological phenomena. The supply of instruments is slowly increasing and we are handicapped more seriously now by limitation of rooms than by deficiency of apparatus. Often students of three different classes are working in the same laboratory equipped for one class only. Students, as well as professional men, must have apartments for the special study of their subjects in order to secure the most satisfactory results.

This department needs rooms well lighted on the north side for microscopical work in plant and animal histology, it needs a room for bacteriological work, and a store room for apparatus, chemicals, and department books. Such an arrangement can not be provided in the present building.

The entire educational equipment of the University is now endangered by some of the necessary biological work that must have heat from continuous gas flames for several days. This alone warrants the separation of the science departments.

In the interest of safety from fire, in behalf of securing better optical conditions, and sufficient room for safe and economical use of apparatus, and in behalf of science work the addition of a Science Hall is most urgently recommended by every interest connected with the Department of Biology.

The earlier this pressing need for a Science Hall at the State University is appreciated and supplied by the state the sooner will she secure the benefits that can only accrue from judiciously equipped institutions of learning and research.

Very respectfully,

M. A. Brannon.

THE MUSEUM.

To the President of the Board of Trustees:

One of the growing demands in North Dakota is a safe depository for a complete and representative collection of her native resources, botanical, zoological, and geological. This demand is increasing for two reasons; the first is that many of the living and fossil organic forms are disappearing, the former being exterminated by adverse conditions and the latter disintegrating with continued exposure, or being discovered and appropriated by outside investigators; the second reason is that, were these specimens collected and rightly classified, they would afford invaluable means of education to the student of this and adjoining states. To illustrate the value of museums in educational work one must remember that the Natural History of a country is represented by its animals and plants; that ancestral forms are represented only by fossils, many being found in great abundance in the geological deposits of this state; that the forms of today are subject to the same laws their ancestors were and with changing conditions some will survive while others will be exterminated by incoming forms; and that in no other way can these lessons be so clearly taught as by a collection and classification of the organisms themselves. These specimens will furnish the facts and data regarding the favorable and unfavorable conditions which prescribe certain limits to living matter everywhere, and afford the proper material for laboratory study of physiological laws and economic value of plants and animals.

An endeavor has been made in the development of the museum at the State University, which, so far as known, is the only state museum in North Dakota, to make collections of native resources and utilize them for educational purposes rather than for side shows, or mere attractions to those who pine for amusement. An attempt is being made to gather the representative clays, coals and fossils from various portions of the state, to collect and preserve the typical animals of North Dakota, many of which are almost extinct, and also to secure a botanical collection which shall be most instructive to our students in the study of crops and forage grasses.

This collection cannot be made without proper assistance and equipment, but if these are provided the State University Museum as an educational depository of the representative geological, zoological and botanical possessions of the state can be greatly enlarged and made correspondingly more valuable. Not only will it be a means of great efficiency in promoting the educational interests of the state, but it will be very instrumental in publishing her rich and varied resources to the world.

For the museum larger space should be provided and this could be secured easily in providing a common building for the science departments.

Very respectfully,
M. A. Brannon,
Curator.

DEPARTMENT OF CHEMISTRY AND BIOLOGY.

To the President of the Board of Trustees:

The work of the Department of Chemistry and Geology is divided between that of instruction and that of investigation. During the past two years instruction has been given in four courses of Chemistry and one of Geology and Mineralogy. Those who elect the fourth course of chemistry will have had four years' work in this line of study. Most of these classes are required to spend two hours daily in the laboratory. The classes are large, in some cases nearly twice as large as can be accommodated in the laboratory at one time. The instruction begins with elementary chemistry and extends through organic chemistry, qualitative analysis, quantitative analysis, assaying of ores, commercial analysis, analysis of foods and water, technical analysis connected with manufacturing enterprises and original investigations. One of the most encouraging features of the work is the number of pupils taking the advanced courses. Besides the regular class work a large amount of scientific investigation is constantly being carried on in this department. The work is of a practical nature and consists for the most part of analysis and value determinations of specimens of various kinds, such as minerals, soils, vegetable products, waters, etc., which have been sent in from various parts of the state. It is not an easy matter to recognize the volume and importance of such work. These investigations have been limited by lack of funds and lack of help in the department.

The increasing demands upon the Department of Chemistry and Geology for such work as has been mentioned, and the rapidly increasing number of students seeking advanced courses in chemistry call for a corresponding increase in rooms, apparatus and help. The professor in charge has made a faithful effort to do the work of instructing these numerous large classes and at the same time do the large amount of analytical work sent in from over the state and attend to the geological field work. Of course it is impossible under such circumstances to do what should be done. The one attempting this has been fairly overwhelmed. All of this work is of great importance and should be given much more time and attention than it is possible for one man to give. Twenty-four hours per day is not time enough for one man to do the work constantly demanded from this department. The necessary work is accumulating more rapidly than it can be discharged. More assistance is imperatively demanded if the work is to be kept up even in the most unsatisfactory style. In many eastern and western schools having a much smaller attendance than this institution the work which is supposed to be done by the head of this department is divided between three or more men. To make the matter worse the laboratory room in this institution is altogether inadequate. Nearly every available foot of floor and wall space has been forced into use and still the classes have been so large that the only possible way to get desk room was to divide the class into two or three sections, causing a large loss to the state and an added burden to the teacher. The average increase in the number of pupils taking work in the department is about 30 per cent. per year. But the capacity of the laboratory has now been far exceeded. *A new building for science work is a most pressing need.* It is impossible to see how, in the present quarters, it will be possible to provide for farther growth in number or in quality of work. Besides this, there are several hundred dollars worth of specimens packed away, the use of which is lost entirely because of lack of room. On account of this lack of space many costly instruments are kept where they come in contact to a greater or less degree with corroding chemicals, which will in a short time ruin them and thus cause a loss of many hundreds of dollars to the state. Again, located as the laboratory is in small rooms in the basement. it becomes impossible to work without frequently filling the rooms and even the entire building with irritating and often very poisonous gases. Finally, the danger of fire to the building in which the chemical laboratory is situated is of necessity very great. In such a laboratory there must be stored scores of chemical compounds which are either explosive or very readily combustible. This danger is clearly seen by the number of fires which have originated in the chemical laboratories of many colleges. On account of the conditions just pointed out the absolute necessity of a science building at this period in the history of the institution will be apparent as a requisite for growth. The sum of $30,000 should be appropriated for a suitable building in which to place the Biological, Physical, Chemical and School of Mines laboratories and testing rooms.

Respectfully,
E. J. Babcock,
Professor of Chemistry and Geology.

GEOLOGICAL SURVEY.

To the President of the Board of Trustees:

Recognizing the vast importance of the mining industry in some form or other, most of the states of the Union have established Geological Surveys and Mining Schools. The importance of these schools has also been recognized by the general government by setting aside a large amount of land for their aid.

A School of Mines has been located by Congress in North Dakota as a department of the University, but owing to the lack of any appropriation nothing has as yet been done toward operating this department. The last legislature recognized that the time had come when the interests of the state demanded that the work be begun. It therefore made a small appropriation, simply enough to organize and commence the work of a geological survey of the state. The survey has been begun and we believe that the work will very soon fully show its utility and economic value to the whole state.

It has been the desire of the geologist in charge of this work to make a thorough and systematic geological and mineral survey of the entire state, to publish from time to time the results of these investigations, and to assist in every way possible in developing the natural resources of the commonwealth. Such a survey is provided for in most of the states and has proved itself of great value. It will be especially important in a new state like North Dakota, for it will show the existence and value of resources which would otherwise remain unknown. Those who think North Dakota devoid of all mineral resources have a mistaken notion. This idea comes from the fact that up to this time there has been made almost no thorough scientific research to reveal these resources. While our state may never appear as a great mining state, yet it possesses some mineral deposits which are almost certain to become extensively used.

Something is known of the vast deposits of lignite coal, but it is surprising how little the immense value of these deposits is appreciated. The region possessing these deposits should be helped to a thorough scientific survey and investigations should be carried on for the purpose of discovering and making known the best and most economical methods of burning these coals. The geologist has been over most of the coal regions during the past summer and work of this kind has now been begun. The preliminary results will be published in the first report to be issued during the coming winter. Beds of rare and very valuable clay and deposits of good building stone have been discovered in this state. There is no reason why in time large industries cannot be built upon these resources.

A still more important geological study is that of the water supply of the state. During the past two years a study of this problem has been pretty well started by the State Geologist and the results of this work, which has been carried on in connection with the United States Geological Survey, will be included in the report soon to appear.

Several hundred samples of water from different sources and from various parts of the state have been examined and a study of the geological conditions made, for the purpose of pointing out the best methods of regulating the supplies and uses and for improving the character of water in many regions. Too much importance cannot be attached to such work since the health, happiness and prosperity of a community depend to a large degree upon the water supply.

The building up of a geological and topographical map of the state has already been begun. The first report of the Geological Survey of the state, to be issued within a few weeks, will embrace the topography and general geology of North Dakota, studies on the water supply, building materials, coal and other resources of the state. It is hoped that the result of the investigations which have been carried on during the past two years as embodied in the forthcoming report of the survey will many times repay the trifling expense it has caused the state. Every dollar expended on a Geological Survey will doubtless bring back to the state several hundred fold. The enormous profit derived by the older states from expenditures on such geological surveys is unquestionable. North Dakota should in time secure equal benefits from the prosecution of the survey now begun.

Respectfully,
E. J. Babcock,
State Geologist.

DEPARTMENT OF PHYSICS.

To the President of the Board of Trustees:

I am glad to report that the appropriation to this department last year has enabled me to purchase apparatus which greatly facilitate the work. As an addition of greatest value I may mention the gasolene engine and dynamo which this department, together with the Department of Chemistry, obtained last year. There are of course yet a great many pieces of apparatus wanting that are very necessary in order to do first class work, but if in the future the annual apporpriations can be made equal to the appropriation of the last two years, these wants may be supplied.

The work is, however, greatly hampered by the lack of sufficiently large and suitable rooms. I shall not enter into details in giving the reasons for this statement, but a very brief mention of some of them may not be out of place. It is a fact that many of the experiments performed in a physical laboratory are of such a nature, that, in proportion to the number of students, more room is needed than in any other department. This is because many of the apparatus used are very sensitive to disturbances of any kind in their vicinity. Especially is this true of galvanometers, magnetometers, etc., used in the study of electricity and magnetism. In the study of light it frequently happens that some students are performing experiments which require full daylight, while others are working with expernments which must be performed in a dark room. It is also true that, if there was sufficient room, many of the apparatus used by the college classes could be permanently set up, while at present they must be moved about several times during the year, so that a great deal of extra work must be done, and the apparatus are never in as good a condition as they would be if they were left in one place.

Believing that the greatest need of the institution, as far as buildings are concerned, is a science hall, I respectfully ask that the Board of Trustees take the necessary steps to erect a building for the Biological, Chemical and Physical laboratories.

Respectfully,

Carl J. Rollefson.

NEEDS.

Perhaps the most urgent need of the institution, as will appear from the foregoing reports, is a new science hall. At present the laboratories are located in the building known as the Main Building, in which are situated the recitation rooms of all departments in the University, except the Law Department, which has for the present quarters in Grand Forks City. The main building has become entirely inadequate for the rapidly growing needs of the University in the way of recitation rooms, laboratories, library, museums, etc. Such a building as would be suitable for the combined work of our science departments would cost in the neighborhood of $30,000. At the last session of Congress a bill providing for the establishment of a School of Mines in the several states was favorably reported by the Committee on Mines and Mining of each House, but was not brought up for final passage. It is believed that the bill will be put upon its passage shortly after the convening of the present session of Congress and will pass both houses without serious opposition. This bill, if passed, will give to each state the sum of $10,000 the first year, this sum to be increased by $1,000 yearly until it reaches the sum of $15,000 per annum. Under the provisions of this bill each state is to furnish suitable buildings for a School of Mines. The proposed new Science Hall at the University will, it is believed, serve for some years to come as a suitable home for the proposed School of Mines, while at the same time affording ample quarters for the several science departments of the institution. Other needed buildings are a library building and ladies' dormitory. Our library at present numbers about 8,000 volumes, and its quarters in the main building have long since been outgrown. A library building costing, say, $20,000, and containing six or eight lecture rooms would meet for many years the growing needs of the library as well as the constantly increasing demands for new lecture rooms. At present the same lecture room is used in many instances by several different departments of the University. Each department, in order to do efficient work, should have a home of its own, free from the intrusion of other departments.

The present ladies' dormitory has for several years been greatly overcrowded, especially during the winter term. It his been found necessary each year to put four young ladies in a room and to use during the winter term the hospital wards, and in some cases the hallways, as bed rooms. With the rapidly growing attendance a new ladies' dormitory, costing, say, $25,000, would soon be filled. The University is located two and one-half miles from Grand Forks and it is not practicable for young ladies living at a distance to find temporary homes in Grand Forks City while attending the University. The cost of room and board in town would of itself be practically prohibitory in the case of our young women students, apart from the serious inconvenience entailed in getting to and from the University during the winter months. A new science hall and a new ladies' dormitory are urgently needed and must be provided in the very near future if the University is to develop in proportion to the rapid increase of our population and the rapidly growing demand for educational facilities for the young people of the state.

IMPROVEMENTS.

During the summer of 1899 extensive improvements were made to meet the long deferred needs of the University. Chief among these improvements were a new dormitory building for the young men, a new electric lighting and steam heating plant, and a new sewer system. All of these improvements had long been needed and the demand for them could not be longer deferred. For many years the older students had been lodged on the upper floors of the main building, recitation rooms being set aside temporarily for this purpose. The growing needs of instruction rendered necessary the removal of the young men from the main building and the erection of a young men's dormitory for their accommodation. The heating plant in the basement of the main building had become worn out and had for some time been inadequate to the demands made upon it. An entirely new heating system was installed, from which all buildings of the institution are at present heated according to the most improved methods and much more economically than heretofore. The new furnaces have been especially fitted for the burning of North Dakota coal and that fuel has been used exclusively during the latter half of the present year, and will be used exclusively hereafter. The buildings are at present lighted by electricity, which affords a much better light at less expense than the old system of lighting by kerosene lamps. Under the old sewer system, which had supplied the University for many years, the sewage had been conveyed into a neighboring coulee at a point only a few rods distant from the main building and one of the dormitories. This coulee had become so poisoned with the accumulations of many years as to be a serious menace to the health of the institution. Some change had to be made and it was thought best, in making this change, to provide a permanent sewer system which would be ample to meet the needs of the institution for many years to come. The sewage is now conveyed to a point nearly one-third of a mile distant from the University grounds. The improvements named were made in the most economical manner possible, due regard being had to thoroughness of construction and the growing wants of the University. The cost of all of these improvements was in the neighborhood of $47,000. In the absence of a specific appropriation for these improvements, certificates of indebtedness were issued by the Board of Trustees to be paid out of the proceeds of the 2-5 mill bill passed at the last session of the legislature. Of this indebterness $9,000 has already been paid from the current income of the University but it will be impossible to pay the remainder of this indebtedness in the same way and leave a sufficient income available for meeting the current and constantly increasing necessary running expenses of the institution. In view of the growth of the state, which means a rapidly increasing constituency for the University from which to draw its attendance, the current expenses of the University for instruction, new books, new apparatus, etc., must necessarily increase in proportion. In order to meet obligations already incurred for necessary improvements and to provide for further greatly needed improvements in the near future, the Board of Trustees will feel constrained to ask the legislature at its coming session for permission to bond the University lands for a sum not to exceed $80,000. The University owns, under the provisions of the enabling act, 126,080 acres of land. None of this land may be sold for less than $10 per acre. A small portion of it, it is probable, would already sell for that price and a considerable portion of it will in all probability soon be worth that price.

The buildings which should be erected in the next two or three years will serve the University for generations to come. It is not unreasonable, therefore, to ask that the liberal provision made by the Federal Government for the future wants of the University should, to a limited extent, be made available for present needs. It is doubtful whether an institution of learning ever has needs, in its subsequent development, as urgent as those which present themselves in the first two decades of its existence. As wide a range of philosophical and other apparatus and as wide a range of books of reference in the various departments of knowledge are required for an attendance of 300 students as for an attendance of 3,000. As the recently constructed buildings with their improvements were largely provided with reference to the needs of future generations of students, it is only fair that the future be taxed in sime slight measure to partially defray the cost of these improvements. It is greatly to be hoped, therefore, that the next legislature will authorize the trustees to bond the University lands for a sum not to exceed $80,000. The minimum of proceeds which can, under the enabling act, be realized from the sale of the University lands is in excess of $1,250,000. It is altogether probable that actual sales will realize at least $2,000,000. Under the circumstances it certainly will not be improvident for the University to draw to the limited extent indicated above upon the future for the supply of needed permanent improvements, of which future generations will reap the larger part of the benefit.

MILITARY DEPARTMENT.

At the outbreak of the Spanish-American war the Military Detail which had for some years been granted us by the Federal Government was withdrawn. In the absence of a detail the department has been kept up under the direction of one of the older cadets, and the efficiency of the department has been fairly well maintained. It is desirable, however, that the department be supplied as soon as possible with a commandant from the regular army and negotiations are now under way by which it is hoped to secure the services of a retired officer from the regular army.

The basement floor of the new young men's dormitory has been used the past year as an armory and drill hall and serves very well for this purpose. Eventually, however, this space will be required for dormitory purposes and it will be necessary to erect a special building for the accommodation of the Military Department.

Only students in the Preparatory Department and in the Freshman and Sophomore Classes of the College Department are required to take military drill. Four years of drill is the maximum requirement for any student. During the last school year 136 students received instruction and performed drill service in the Military Department.

INSTRUCTIONAL FORCE.

With the exception of three new instructors, the instructional force remains the same as at the date of my last report. One of these instructors takes classes which were formerly conducted by the military officer detailed at the University, so that only two of these instructors serve as an addition to the instructional force reported two years ago, and one of these gives the larger part of her time to the library as librarian.

In several cases two important departments are at present under the management of a single professor. The time will soon come when it will be necessary to separate these departments and place a full professor in charge of each. This is true particularly of the departments of Mathematics and Physics and the departments of History and Philosophy. The Department of Scandinavian Languages, also, is at present carried by the professor in charge of Physics and Mathematics.

The law provides for a separate chair of Scandinavian, and compliance with this law will necessitate, as soon as the University is in a position to meet this requirement, the employment of a full professor of Scandinavian languages and literatures.

Our professors are all men who have devoted many years to preparing themselves for the work of instruction as specialists. They are men whose abilities would command for them in almost any business pursuit a far larger income than they receive for their work in the University. No institution of higher learning can do creditable work with inferior instructors. While the salaries paid by the University have hitherto, perhaps, been as large as the state could afford, the time is soon coming when the University will have to pay larger salaries in order to hold its best men and secure the services of new professors who will reflect credit upon the institution. The salaries paid at the University are much smaller than those paid at the State Universities to the east of us, and smaller, in many instances, than those paid in states admitted to the Union since the admission of North Dakota. Many of our professors are seriously overworked, some of them carrying as high as five recitations a day, or twenty-five hours of recitations per week. This is more than twice the number of recitations required weekly of professors in many of the older Universities. I need not remind you that the surest way to fossilize an institution of learning is to fossilize its professors by so overburdening them with routine work as to leave them little or no time for study and investigation. Within the next year it will be necessary to employ at least three additional heads of departments.

While the present income of the University is more liberal than it has been in some recent years, it is not greater and will not be, even with the annual increase in the assessed valuation of the state, than is needed to meet imperative demands of the institution for instruction and equipment. The plan of permanent and fixed appropriation adopted by the legislature at its last session is in line with the most approved usage in other states and is the only sensible plan to be pursued by a commonwealth in the maintenance of its State University. Several states have appropriated a much larger fraction of a mill on the dollar than is appropriated by North Dakota for the maintenance of its University; the annual fixed appropriation of one state, Nebraska, being a full mill on the dollar. Few realize how costly is the work of higher education as conducted in modern times. Several of the great colleges of the country spend annually a sum in excess of $1,000,000, exclusive of the very considerable sums spent from time to time in permanent improvements. The chief value of a State University to a commonwealth, in the view of our leading educators, does not consist in the instruction it affords, but in its uplifting influence upon all the lower grades of public instruction. If this view be correct, the entire annual cost of maintaining its State University may easily be saved by the state in the increased efficiency of its common schools alone, for which our state spends annually more than a million dollars for current expenses. As President Schurman of Cornell University has recently said: "The uplift of the higher upon the lower is one of the profoundest truths in modern education. No community can long maintain a system of common schools, worthy of the name, without the secondary school above, and no community can long maintain a system of secondary schools worthy of the name, without the College and University above."

Accompanying this report will be found a tabulated statement of all expenditures between June 30, 1898, and June 30, 1900.

Respectfully submitted,
DAVID BARTLETT.

COURSES OF STUDY.

PREPARATORY DEPARTMENT.

REQUIREMENTS FOR ADMISSION.

Applicants for admission to the Preparatory Department must pass a satisfactory examination in Arithmetic, English Grammar, United States History, and Geography. Papers may be rejected if illegible or deficient in orthography.

Students who have completed any of the preparatory subjects elsewhere are granted the privilege of an examination in those subjects at the time of entrance.

A certificate of the state high school examiner is accepted in any subject in lieu of an examination.

PROGRAM OF STUDIES IN THE PREPARATORY DEPARTMENT.

a. Required Courses:

FULL COURSES.

1. Rhetoric
2. Algebra
3. General History
4. El. Biology
5. Geometry
6. Civics and Economics
7. English
8. Physics

HALF COURSES.

1. Drawing
2. Vocal Music and Elocution
3. Military Science (for men).

b. Four of the following electives:

1. Latin, I.
2. Latin, II.
3. Latin, III.
4. Latin, IV.
5. Greek, I.
6. Greek, II.
7. Chemistry, I.
8. German, I.
9. German, II.
10. French, I.
11. French, II.
12. Scandinavian, I.
13. Scandinavian, II.
14. Drawing and Painting
15. Stenography and Typewriting
16. Commercial Course
17. English
18. Pedagogy, I.
19. Science (Physiog., Geol. and Ast.)
20. Science of Gram., Arith. and U. S. His.

EXPLANATION.

The terms used and recommended by the committee of the National Educational Association on College Entrance Requirements, and unanimously adopted by that body in 1899, are used both for the Preparatory Department and for the Normal and College Departments:

1. *Program of Studies* includes all the studies offered in any department.

2. *Curriculum* means the group of studies schematically arranged for any student or set of students.

3. *Course of Study* means the year's work, five times a week, in any given subject.

The *Courses of Study* are the unit out of which curriculums and programs are made.

All of the above courses of study are begun at the opening of the school year in September.

It will be seen from the foregoing program of studies that a great number of curriculums is possible owing to the wide range of electives allowed.

The first year a student will be allowed to take 3½ required courses and one elective, making 4½; and if at the end of the year his average standing be 80 per cent., without a condition in any subject, he may continue to carry the same number of courses, thus completing the Preparatory Department in three years; otherwise he will be limited to 3½ courses each year, thus requiring four years for completion.

COLLEGE DEPARTMENT.

REQUIREMENTS FOR ADMISSION.

To be admitted to the College Department, a student must have completed either the work of our Preparatory Department or work which, in the judgment of the Faculty, is its equivalent. A candidate who has not come up through our Preparatory Department must pass an examination in the subjects in that department; but certificates of the state high school examiner and certificates of the principal of a high school of the first class in this state or of a school in another state accredited by the State University of that state, are accepted in lieu of an examination. A principal's certificate must in all cases state specifically the amount and quality of the work done.

A candidate whose preparation is defective, but who gives promise of success, may be admitted with conditions.

REQUIREMENTS FOR GRADUATION.*

The degree of Bachelor of Arts is conferred upon students who have satisfactorily completed one of the four curriculums.

CURRICULUM I.

Greek: Courses I, II, III.
Latin: Courses V, VI.
English: Courses I, II.
Modern Languages: Two courses in some one language.
Chemistry: Course I.
History: Course I.
Logic and Psychology: Course I.
Electives: Four Courses.

CURRICULUM II.

Latin: Courses V. VI.
English: Courses I, II.
Modern Languages: Four courses, (two in each of two languages.
Chemistry: Course I.
History: Course I.
Logic and Psychology: Course I.
Electives: Five Courses.

CURRICULUM III.

English: Courses I, II.
Foreign Languages: Four Courses, (two in each of two languages.
Mathematics: Course I.
Chemistry: Course I.
or Physics: Course I.
Biology: Course I.
History: Course I.
Logic and Psychology: Course I.
Electives: Five courses.

CURRICULUM IV.

English: Courses I, II.
Foreign Languages: Four Courses, (two in each of two languages.
Chemistry: Course I.
History: Course I.
Social Science: Course I.
Philosophy: Course I.
Logic and Psychology: Course I.

Electives: Five Courses.

In addition to the above named required courses of study, two recitations a week in Military Science are required in the Freshman year of every male student who is not excused by the Faculty, or who has not previously completed that work in the Preparatory Department.

NORMAL CURRICULUM.

1. Rhetoric and Composition.
2. Algebra.
3. Pedagogy I.
4. (a) Vocal Music (3); Elocution (2).
   (b) Drawing I (5).
5. General History.
6. Elementary Biology.
7. Geometry.
8. Civics and Economics.
9. Literature.
10. Foreign Language (Lat., Gr., Fr., Ger., Scan.)
11. Physics.
12. Science of Grammar, Arithmetic and U. S. History.
13. Foreign Language (Lat., Gr., Fr., Ger., Scan.)
14. Science (El. or College.)
15. English I.
16. Logic and Psychology I.
17. Elective.
18. Pedagogy II.
19. Elective.
20. Elective.

(Practice Teaching).

LAW DEPARTMENT.

FIRST YEAR.

Contracts, Mr. Blair *Three hours a week.* Langdell & Williston, *Cases on Contracts.*

Criminal Law and Procedure, Judge Cochrane. *Two hours a week.* Beale's *Cases on Criminal Law.*

Real Property, Mr. Blair. *Two hours a week.* Gray's *Cases on Property,* Vols. I and II.

Personal Property, Mr. Blair. *Two hours a week during first term.* Gray's *Cases on Property,* Vol. I.

Torts, Judge Corliss. *Two hours a week. Cases on Torts,* Ames & Smith, Vols. I and II.

Civil Procedure, Mr. Blair. *One hour a week.* Ames's *Cases on Pleading.*

Agency, Mr. Bangs. *Two hours a week for eighteen weeks.* Wambaugh's *Cases on Agency.*

Sales, Mr. Skulason. *Two hours a week for eighteen weeks.* Williston's *Cases on Sales.*

SECOND YEAR.

Corporations, Private and Municipal, Mr. G. A. Bangs. *Two hours a week.* Smith's *Cases on Private Corporations,* Smith's *Cases on Municipal Corporations.*

Equity, Mr. Blair. *Two hours a week.* Keener's *Cases,* and Ames's *Cases on Trusts.*

Evidence, Mr. Tracy Bangs. *Two hours a week.* Thayer's *Cases on Evidence.*

Property (continued), Mr. Blair. *Two hours a week.* Gray's *Cases on Property,* Vols. III, IV, V, and VI.

Carriers, Mr. Skulason. *Two hours a week for eighteen weeks.* McClain's *Cases on Carriers.*

Bills and Notes, Judge Fisk. *Two hours a week for eighteen weeks.* Ames's *Cases on Bills and Notes.*

Private International Law, Judge Corliss. *One hour a week.*

Damages, Ten lectures. Beales's *Cases on Damages.*

Bankruptcy, Ten lectures.

Suretyship, Fifteen lectures.

North Dakota Practice, F. B. Feetham.

REPORT OF THE SECRETARY OF THE BOARD OF TRUSTEES.

Summary of expenditures of the State University from July 1, 1898, to December 31, 1900.

JULY, 1898.

Instruction	$ 1,656.69	
Biology	12.00	
Repairs	95.00	
Engineer and assistants	108.34	
Military department	30.00	$ 1,902.03

AUGUST, 1898.

Instruction	$ 1,656.62	
Chemistry and geology	2.09	
Repairs	197.89	
Heat and light	101.63	
Engineer and assistants	108.33	
Incidental	.82	
Military department	30.00	
Deficiency (correction)	1.03	$ 2,098.41

SEPTEMBER, 1898.

Instruction..	$ 1,656.62	
Engineer and assistants..	108.33	
Military department..	30.00	$ 1,794.95

OCTOBER, 1898.

Instruction..	$ 1,656.62	
Mathematics and physics	86.35	
Engineer and assistants..	108.33	
Military department	269.00	$ 2,120.30

NOVEMBER, 1898.

Instruction..	$ 1,656.62	
Biology	24.81	
Chemistry and Geology..	53.28	
Heat and light..	496.88	
Engineer and assistants..	329.96	
School of Mines..	60.08	
Military department..	40.07	$ 2,661.70

DECEMBER, 1898.

Instruction..	$ 115.00	
Biology..	19.51	
Incidental..	51.11	
Engineer and assistants..	260.45	
Militay department..	30.00	$ 476.07

JANUARY, 1899.

Instruction..	$ 100.00	
Biology..	38.38	
Engineer and assistants..	108.33	
Incidental	166.66	
School of Mines..	75.34	
Military department..	45.00	$ 533.71

FEBRUARY, 1899.

Instruction..	$ 60.07	
Biology..	15.92	
Mathematics and Physics..	194.91	
Engineer and assistants..	134.65	
Military department..	53.63	
Water supply..	127.55	$ 586.73

MARCH, 1899.

Deficiency..	$ 7,435.52	
Instruction..	1,686.62	
Engineers and assistants..	108.33	$ 9,230.47

APRIL, 1899.

Instruction..	$ 1,686.62	
Repairs..	166.38	
Engineers..	108.33	
Balance of deficiency..	64.48	$ 2,025.81

MAY, 1899.

Instruction..	$ 1,686.62	
Building..	4,000.00	
Engineers..	108.33	
Incidentals..	200.00	$ 5,994.95

JUNE, 1899.

Instruction..	$ 1,686.62	
Library..	9.02	
Repairs..	63.57	
Engineers..	108.33	
Incidentals..	232.13	
Water supply..	300.00	
Building..	1,300.00	$ 3,699.67
Total for fiscal year 1898-1899..		$33,124.80

JULY, 1899.

Instruction..	$ 1,904.11	
Library..	50.00	
Repairs..	200.00	
Heat and light..	1,050.00	
Engineer..	41.66	
Housekeeper	83.33	$ 3,329.10

AUGUST, 1899.

Instruction	$ 1,987.44	
Building	1,200.00	
Library	50.00	
Engineer	41.66	
Housekeeper	83.33	$ 3,362.43

SEPTEMBER, 1899.

Instruction	$ 1,995.77	
Building	1,200.00	
Engineer	41.66	
Incidentals	60.00	
Housekeeper	83.33	$ 3,380.76

OCTOBER, 1899.

Instruction	$ 1,995.77	
Building	4,600.00	
Biology	207.54	
Repairs	778.25	
Heat and light	395.79	
Incidentals	860.20	
Engineer	41.66	$ 8,879.21

NOVEMBER, 1899.

Instruction	$ 1,995.77	
Chemistry and Geology	156.92	
Library	18.00	
Heat and light	117.37	
Engineers	166.66	
Incidentals	129.50	
Building	1,466.08	$ 4,050.30

DECEMBER, 1899.

Instruction	$ 2,020.77	
Heat and light	948.00	
Engineers	166.66	
Incidentals	773.19	
Military department	81.11	
Building	60.57	$ 4,050.30

JANUARY, 1900.

Instruction	$ 2,020.77	
Mathematics and Physics	462.00	
Chemistry and Geology	380.32	
Incidentals	513.74	
Military department	434.32	$ 3,811.15

FEBRUARY, 1900.

Instruction	$ 2,020.77	
Biology	50.63	
Mathematics and Physics	246.23	
Chemistry and Geology	207.45	
Library	38.09	
Heat and light	961.32	
Engineers	151.66	
Building	135.00	$ 3,811.15

MARCH, 1900.

Instruction	$ 2,020.77	
Building	1,156.39	
Chemistry and Geology	196.69	
Library	76.41	
Heat and light	62.85	
Engineers	151.66	
Incidentals	76.38	
Law department	70.00	$ 3,811.15

APRIL, 1900.

Instruction	$ 2,020.77	
Building	1,497.42	
Library	43.10	
Repairs	153.20	
Engineers	96.66	$ 3,811.15

MAY, 1900.

Instruction	$ 2,020.77	
Building	1,693.72	
Engineers, janitors	96.66	$ 3,811.15

JUNE, 1900.

Instruction	$ 1,979.11	
Building	1,095.75	
Repairs	71.00	
Incidentals	595.29	
Law department	70.00	$ 3,811.15
Total for fiscal year 1899-1900		$49,919.00

JULY, 1900.

Instruction	$ 2,044.95	
Buildings	1,210.16	
Janitor	41.66	
Incidentals	322.72	
Secretary and registrar	66.66	
Law department	125.00	$ 3,811.15

AUGUST, 1900.

Instruction	$ 2,044.95	
Buildings	1,421.29	
Janitor	41.66	
Incidentals	41.59	
Secretary and registrar	66.66	
Law department	195.00	$ 3,811.15

SEPTEMBER, 1900.

Instruction	$ 2,044.95	
Museum	30.00	
Building and repairs	1,376.39	
Heat and light	110.49	
Janitor	41.66	
Incidentals	16.00	
Secretary and registrar	66.66	
Law department	125.00	$ 3,811.15

OCTOBER, 1900.

Instruction	$ 2,044.95	
Chemistry	84.51	
Physics	23.55	
Museum	30.00	
Library	45.07	
Repairs	846.45	
Incidentals	514.96	
Secretary and registrar	66.66	
Law department	155.00	$ 3,811.15

NOVEMBER, 1900.

Instruction	$ 2,044.95	
Chemistry	100.00	
Biology	80.81	
Physics	26.90	
Museum	30.00	
Library	35.00	
Buildings and repairs	82.92	
Heat and light	488.18	
Incidentals	730.73	
Secretary and registrar	66.66	
Law department	125.00	$ 3,811.15

DECEMBER, 1900—ESTIMATED.

Instruction	$ 2,044.95	
Chemistry	251.00	
Heat and light	700.00	
School of Mines	687.04	
Library	85.00	
Physics	178.00	
Law	298.00	
Biology	425.00	
Secretary and registrar	66.66	
Museum	30.00	
Buildings and repairs	821.25	
Incidentals	663.46	$ 6,250.36
Total for six months ending December 31, 1900		$25,306.11

CLASSIFICATION OF EXPENDITURES—FISCAL YEAR 1898-1899.

Instruction	$15,304.72	
Deficiency	7,500.00	
Biology	110.62	
Engineers and assistants	1,700.04	
Repairs	522.84	
Military department	527.70	
Chemistry and Geology	55.37	
Heat and light	598.51	
Incidentals	650.72	
Mathematics and Physics	281.26	
School of Mines	135.42	
Water supply	427.55	
Buildings	5,300.00	
Library	9.02	
Deficiency correction	1.03	
Total		$33,124.80

FISCAL YEAR 1899-1900.

Instruction	$23,982.59	
Library	275.60	
Repairs	1,202.45	
Heat and light	3,535.33	
Engineers	996.60	
Housekeeper	249.99	
Building	14,618.67	
Incidentals	2,494.56	
Biology	258.17	
Chemistry and Geology	941.38	
Military department	515.43	
Mathematics and Physics	708.23	
Law department	140.00	
Total for fiscal year 1899-1900		$49,919.00

SIX MONTHS ENDING DECEMBER 31, 1900.

Instruction	$12,269.70	
Library	165.07	
Heat and light	1,298.67	
Janitor	124.98	
School of Mines	687.04	
Building and repairs	5,758.46	
Incidentals	2,289.46	
Biology	505.81	
Chemistry and Geology	435.51	
Mathematics and Physics	228.45	
Secretary and registrar	399.96	
Law department	1,023.00	
Museum	120.00	
Total		*$25,306.11

*Vouchers for this amount have been sent to the state but are still unpaid.

RECAPITULATION.

Fiscal year 1898-1899	$33,124.80	
Fiscal year 1899-1900	49,919.00	
Total for biennial period		$ 83,043.80
July 1, 1900, to December 31, 1900		25,306.11
Total to December 31, 1900		$108,349.91

Statement of appropriations and income towards the maintenance of the State University.

Balance of appropriation of 1897 (July 1, 1898)..	$11,820.71	
Rental hay lands, etc. (University)..	217.77	
Rental hay lands, etc. (School of Mines).. ..	135.42	
Deficiency appropriation of 1899..	7,500.00	
Two-fifths mill for 1899..	40,503.00	
Two-fifths mill for 1900..	45,733.77	
Rental hay lands, etc. 1900..	1,752.20	
Rental hay lands, etc (School of Mines)	687.04	
Total to December 31, 1900..		$108,349.91

PAY ROLL OF THE STATE UNIVERSITY.

	Per. Year.
Webster Merrifield, M. A., President, Professor of Political and Social Science..	$ 3,000.00
Horace B. Woodworth, B. A., Professor of History and Philosophy..	2,000.00
John Macnie, M. A., Professor of French and German, and Secretary of the Faculty..	2,000.00
Earle J. Babcock, B. S., Professor of Chemistry and Geology, State Geologist and Director of the School of Mines......	2,000.00
Joseph Kennedy, B. S., Principal Normal Department, Professor of Logic, Psychology and Pedagogy..	2,000.00
George S. Thomas, M. A., Ph. D., Professor of the Greek and Latin Languages and Literatures..	2,000.00
Melvin A. Brannon, M. A., Professor of Biology and Curator of the Museum..	2,000.00
Vernon P. Squires, M. A., Professor of the English Language and Literature..	2,000.00
Captain E. C. Bowen, U. S. Army, Professor of Militay Science. Science..	600.00 600.00
George St. John Perrott, B. A., Assistant Professor of Latin and Greek..	1,500.00
Carl J. Rollefson, B.A., Assistant Professor of Mathematics and Physics; in charge of the Scandinavian Languages and Literatures..	1,750.00
Emily K. Reynolds, B. A., Assistant Professor of English and Preceptress..	1,500.00
Elwyn F. Chandler, M. A., Instructor in Mathematics..	900.00
Ethelyn F. Wilcox, B. L., Instructor in Music, Drawing and Physical Culture..	600.00
Elizabeth M. Bratt, Librarian and Instructor in Commercial Branches..	750.00
John R. Selby, B. A., Instructor in Latin, French, English and History..	540.00
Marcia Bisbee, M. A., Instructor in Chemistry..	495.00
Johanna Kildahl, M. A., Assistant Curator of the Museum..	300.00
John E. Blair, B. A., LL. B., Secretary of the Law Faculty, Professor of the Law of Property, Contracts and Equity....	1,500.00
A. E. Morrison, B. A., Secretary of the Board of Trustees, Registrar, and Instructor in Civics and Economics..	800.00

The following members of the Law Faculty are paid at the rate of two dollars and a half per lecture, fifteen hundred dollars being set aside by the Board of Trustees for this purpose for the school year 1900-1901:

Hon. Guy C. H. Corliss, Dean of Law Faculty, Professor of Torts and Private and International Law.
Hon. J. M. Cochrane, LL. B., Professor of Criminal Law and Constitutional Law.
Hon. Tracy R. Bangs, Professor of the Law of Evidence and Agency.
B. G. Skulason, B. A., Professor of Sales and Carriers.
George A. Bangs, Professor of the Law of Corporations.
Hon. C. J. Fisk, Lecturer on Bills, Notes and Checks.
W. L. Nuessle, B. A., Lecturer on Personal Property and Common Law Pleading.
F. B. Feetham, Lecturer on North Dakota Practice.

SPECIAL LECTURERS.

Hon. Chas. S. Amidon, B. A., Lecturer on Equity.
Hon. J. M. Bartholomew, Lecturer on Constitutional Law.
Hon. N. C. Young, M. A., LL. B., Lecturer on Partnerships.
Hon. W. S. Lauder, Lecturer on Insurance
Hon. C. A. Pollock, M. A., LL. B., Lecturer on Property.
Hon. D. E. Morgan, Lecturer on Extraordinary Legal Remedies.
Hon. O. E. Sauter, LL. B., Lecturer on Agency, Bills and Notes.
J. H. Bosard, Esq., Lecturer on Juries and Jury Trials.
Hon. W. H. Standish, Lecturer on Constitutional Law.

	Per Month*
John Sawyer, Engineer	$ 66.00
James M. Hamm, Engineer	51.00
Edward O'Keefe, Fireman	36.00
Herbert Allen, Janitor	41.00
Henry Hemsing, Teamster	39.00
William Strutz, Carpenter	35.00
Annie Chew, Nurse	32.43

*Board not included.

REPORT OF LOANS.

During the summer of 1899 the University made a loan of $45,000, which was placed as follows:

F. R. Fulton & Co., of Chicago, Ill	$30,000.00
Fred Falley, transferred to Citizens' National Bank of Wahpeton, transferred to Christine State Bank of Christine, N. D	5,000.00
First National Bank, Grand Forks, N. D	3,000.00
Union National Bank, Grand Forks, N. D	3,000.00
Geo. S. Thomas, Grand Forks, N. D	4,000.00
	$45,000.00

The principal and interest now stand as follows:

F. R. Fulton & Co.	$24,000.00,	interest paid to September 15, 1900
Christine State Bank	5,000.00,	interest paid to November 1, 1900
First National Bank	3,000.00,	interest paid to September 15, 1900
Union National Bank	3,000.00,	interest paid to September 15, 1900
Geo. S. Thomas	4,000.00,	interest paid to September 15, 1900
	$39,000.00	

This loan draws interest at the rate of seven per cent. per annum, payable semi-annually on the 15th of March and September and at the maturity of the principal. The following amounts are now due:

F. R. Fulton & Co.	$ 6,000.00
Geo. S. Thomas	2,000.00
Christine State Bank	5,000.00
Union National Bank	3,000.00
	$16,000.00

ESTIMATES.

Estimate of the value of apparatus in Physical department.	$ 4,000.00
Estimate of the value of apparatus in Chemical department	4,000.00
Estimate of the value of apparatus in the Bilogical department—	
Microscopes (20)	600.00
Microscopes (dissecting) (74)	75.00
Cases (5)	75.00
Dissecting apparatus	50.00
Accessory apparatus	300.00
Physiological appartus	60.00
Chemicals and stains	150.00
Glassware	60.00
Skeletons	150.00
Mainkin	400.00
Museum, etc.	2,000.00
Models and charts	300.00
	$12,220.00

REPORT OF SECRETARY BOARD OF TRUSTEES.

HOME FUND.

Received from fees of students, etc., 1898-1899	$ 5,265.21
Received from fees of students, etc., 1899-1900	5,328.15
Received from fees of students, etc., six months ending Dec. 31, 1900	3,213.91
	$13,807.27

Part of the above was a temporary deposit by students to cover breakages and was largely refunded to them. Most of the remainder was expended on account of fuel and light, the balance being expended for items too numerous for mention in detail, but vouchers for which are on file in the office of the Secretary of the Board of Trustees.

UNIVERSITY OF ILLINOIS

PRESIDENT'S OFFICE

PUBLIC DOCUMENT NO. 20.

EIGHTH BIENNIAL REPORT OF THE PRESIDENT OF THE BOARD OF TRUSTEES

OF THE

THE LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

UNIVERSITY OF NORTH DAKOTA

TO THE

GOVERNOR OF NORTH DAKOTA.

Including the Reports of the President and the Deans
of the several Departments, and the Report of the
Secretary of the Board of Trustees of the
University, together with the Report
of the Director of the State
Geological Survey,
1904.

BISMARCK, N. D.
TRIBUNE, STATE PRINTERS AND BINDERS
1904

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1904

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7. Report of College of Electrical and Mechanical Engineering.
8. Report of the College of Law.
9. Financial Report.
10. Report of the State Geologist.

BOARD OF TRUSTEES.

	Term Expires.
Hon. WILLIAM BUDGE, Grand Forks	Life Member
Hon. STEPHEN COLLINS, Grand Forks	1905
Hon. A. J. GRONNA, Lakota	1905
Hon. GEORGE E. TOWLE, Park River	1905
Hon. HERMAN SHIRLEY, Enderlin	1907

OFFICERS OF THE BOARD.

Hon. GEORGE E. TOWLE, Park River	President
ANDREW E. MORRISON, University	Secretary
S. S. TITUS, Grand Forks	Treasurer

COMMITTEES OF THE BOARD.

BUILDINGS AND GROUNDS.

WILLIAM BUDGE STEPHEN COLLINS A. J. GRONNA

LIBRARY AND INSTRUCTION.

HERMAN SHIRLEY A. J. GRONNA STEPHEN COLLINS

MUSEUM.

STEPHEN COLLINS HERMAN SHIRLEY WILLIAM BUDGE

FACULTY AND INSTRUCTORS.

ALL DEPARTMENTS EXCEPT THAT OF LAW.

WEBSTER MERRIFIELD, M. A., President,
Professor of Political and Social Science.

HORACE B. WOODWORTH, B. A.,
Professor Emeritus of History.

JOHN MACNIE, M. A.,
Professor of the French and Spanish Languages and Literatures, and Secretary of the Faculty.

EARLE J. BABCOCK, B. S.,
Professor of Chemistry, Mining and Metallurgy, and Dean of the College of Mining Engineering.

JOSEPH KENNEDY, M. A.,
Professor of Philosophy and Education, and Dean of the Normal College.

GEORGE S. THOMAS, M. A., Ph. D.,
Professor of the Greek and Latin Languages and Literatures, and Dean of the College of Liberal Arts.

MELVIN A. BRANNON, M. A.,
Professor of Biology and Curator of the Museum.

VERNON P. SQUIRES, M. A.,
Professor of the English Language and Literature.

JOHN TINGLESTAD, M. A.,
Professor of the Scandinavian and German Languages and Literatures.

CALVIN H. CROUCH, M. E.,
Professor of Mechanical Engineering, and Dean of the College of Mechanical and Electrical Engineering.

ELWYN F. CHANDLER, M. A.,
Professor of Mathematics.

ORIN G. LIBBY, Ph. D.,
Professor of History.

GEORGE W. STEWART, Ph. D.,
Professor of Physics.

GEORGE ST. JOHN PERROTT, B. A.,
Assistant Professor of Greek and Latin.

*SAMUEL PETERSON, Ph. D., D. C. L.,
Assistant Professor of Political and Social Science.

ALICE W. COOLEY,
Assistant Professor of Education.

ARTHUR G. LEONARD, Ph. D.,
Assistant Professor (in charge) of Geology and Mineralogy, and State Geologist.

W. M. BRYANT, M. Acct.,
Principal of the School of Commerce.

MARCIA BISBEE, M. A.,
Instructor in Chemistry.

JOHANNA KILDAHL, M. A.,
Instructor in Biology and Assistant Curator of the Museum.

*MAY C. PETERSON, B. A.,
Instructor in English.

*WILLIAM S. HAZELTON, B. A., B. S., M. E.,
Instructor in Mechanical Engineering.

BURDETTE L. MAIN,
Instructor in Music and Elocution.

EDITH M. MAIN,
Instructor in Freehand Drawing.

CASIMIR H. WALLINGER,
Instructor in Shopwork.

ELEANOR GILLETTE,
Instructor in Shorthand and Typewriting.

JENS M. RYSGAARD, B. A.,
Instructor in Mathematics and Physics.

MARY E. DONOVAN, B. A.,
Instructor in English.

GERTRUDE BEERS,
Instructor in Commercial Branches.

HOWARD L. SCHUG, B. A.,
Instructor in Latin and German.

**JAMES E. BOYLE, Ph. D.,
Instructor in Economics, Sociology and History.

**ALBERT J. BECKER, B. S. M. E.,
Instructor in Mechanical Drawing.

*REX B. KENNEDY, Ph. D.,
Physical Director and Commandant of Cadets.

**G. J. SWEETLAND, Jr., B. S., M. D.,
Physical Director and Commandant of Cadets.

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*Resigned.
**Elect.

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Secretary to the President.

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*Resigned.
**Elect.

LETTER OF TRANSMITTAL.

UNIVERSITY, N. D., ———————— 1904.

Hon. Frank White, Governor of North Dakota:

SIR:—I have the honor to transmit herewith the report, for the biennial period ending June 30th, 1904, of the president and the deans of the several departments and the report of the secretary of the board of trustees of the University of North Dakota, together with a brief preliminary report of the state geologist.

The work carried on in the several departments of the university during the last biennial period has been quite exhaustively set forth in the reports of the president and the deans of the several departments. The financial condition of the university for the last biennial period is shown in the report of the secretary of the board of trustees. In transmitting these several reports, there remains but little for me to add.

Early in the morning following the close of the last fall term of the university, fire was discovered in the recently erected Mechanic Arts building. The flames were already under considerable headway, but the employees of the university and such of the young men among the student body as had not left for their homes were summoned at once and with the assistance of the Grand Forks fire department soon had the flames under control. The total damage done to the building and contents was adjusted at $3929.31. This sum was promptly paid over to the university by the several companies in which the structure had been insured, and the damage was so far repaired that the work of the College of Mechanical Engineering was resumed at the opening of the winter term. This was the first and the only fire which has occurred in connection with any university building in the twenty-one years during which the university has been in existence.

In August, 1903, the supreme court of the state declared unconstitutional the issue of $150,000 of university bonds which had been authorized by the state legislature at its previous session for the purpose of funding a floating debt of $92,000 and of providing for the erection of much needed buildings at the university. This decision not only put a stop to all further building at the university, but left unprovided for the $92,000 of floating indebtedness which had been incurred in the erection of imperatively needed new buildings.

during the previous biennial period. As the legislature, by authorizing an issue of bonds to cover this floating indebtedness, countenanced the action of the board of trustees in incurring this debt, there is no doubt that the coming legislature will feel it incumbent upon itself to make some provision for taking care of the floating university warrants. The state has received full value for every dollar of this indebtedness in the way of permanent and greatly needed improvements. To repudiate the obligation or to refuse to provide for the care of it by direct appropriation or in such other manner as may seem to be practicable would be dishonorable in the extreme and would, for a long time to come, seriously impair the credit of the state. As the last biennial report of this board sets forth very fully and clearly the circumstances under which the present floating indebtedness was incurred, I venture, by way of justification of the action of the board in incurring this indebtedness, to quote somewhat in extenso from that report: "The last two years have been a period of transition for the university from a struggling college, somewhat meagerly, if never grudgingly, supported by a state itself heavily encumbered and with limited productive resources, to a true university, embracing many departments of learning and representing educationally a commonwealth of great potential resources, which, during the period under consideration, have experienced a development rarely exampled in the history of American commonwealths. North Dakota during the past two years has been in a position similar to that of Minnesota between the years 1882 and 1884—a period in which not only the general industries of the state but its state university especially experienced a greater aggregate development than during the two decades previous. Two years ago all the work of instruction and administration in the university was carried on in a single building. More than one high school in the state was better housed and far more adequately equipped for the work than was the state university. The work of the three science departments was carried on in crowded, dimly lighted and almost wholly unventilated quarters, most of them situated in a damp basement, and all of them ridiculously unfit for the purpose to which they were devoted. Hundreds of high schools east and west were far better equipped for doing modern scientific work. In view of the crying demand for more suitable quarters and a more ample equipment for the science work of the university, and of the fact that the university had recently been put upon a sound financial basis, as regards income, and that its magnificent grant of land was rapidly increasing in value, the trustees felt, not only that they were fully justified in anticipating the future ample income of the university in order to relieve a situation which had become intolerable, but that they would be false to a sacred trust were they weakly to fail to do so. The trustees were unanimous in the opinion that the splendid land grant of the University could never be more usefully and worthily utilized than by becoming the basis of a loan, the proceeds of which should be used for the erection of a suitable home for the science departments and of a suitable building for the recently established colleges of electrical and mechanical engineering. The reasons for establishing the latter departments have been very fully set forth in the president's report and need not be repeated here. Suffice it to say that these reasons seemed to the trustes too convincing to be disregarded. The current income of the university from the 2-5 mill tax was barely sufficient to meet the pressing needs for maintenance. Nothing remained for the trustees but to incur the expense of erecting two new buildings for the science and engineering departments respectively and to meet the expense by the issue of warrants fundable in bonds secured by the land grant of the university, when the authority of the legislature for such bonds should be obtained. The new buildings necessitated an increase in the capacity of the heating and lighting plants and a part of the proceeds from the sale of warrants was devoted to this purpose. During the past summer the president of the university was married and it became necessary to erect a president's house for the accommodation of his family. The great distance of the university from town and the presence of a dormitory system, thereby entailed, makes it necessary for the president to live at the university. The quarters in one of the dormitories which had served fairly well for an unmarried president were unsuitable for a man with a family. The president of an important institution of learning is always expected to entertain the invited guests of the institution, and it is highly important that the president's house be the social center of the institutional life. No president would be willing to erect for himself an expensive house on the prairie two miles from town, which he might not be able to dispose of on severing his connection with the institution. Nothing remained, therefore, but for the trustees to erect a residence for the president on land belonging to the university. In so doing they have but followed the custom of almost every important college and university in the country. If such a building were to be erected it must, of course, be of such a character architecturally as would be in keeping with the increasing dignity of the university and at the same time must be sufficiently commodious to meet the needs of a president's residence for many years to come. The trustees have kept this twofold consideration in mind in the construction of the new president's house. As the president of the university has pointed out in his report, the great eastern universities are paying far more attention than formerly to architectural beauty in the construction of their buildings and far more than is generally paid by western universities. President Northrup of the University of Minnesota, on his return from the recent inauguration of Woodrow Wilson as president of Princeton University, addressed his students in chapel in part as follows: 'While the work done in Minnesota compares very favorably with that of the older colleges of the east, there is a marked difference in the artistic surroundings. The eastern colleges seem to have an abundance of wealth and to know how to use it. Their buildings, chapels and class rooms are works of art and are much more pleasant than we have. Princeton is a notable example; her buildings are overgrown with ivy and the interiors are very attractive. Many of her alumni have attained great wealth and have come back to the college town, and spend their time trying to aid and beautify their Alma Mater.'

"The president pays a rental for the house sufficient to meet the interest on the money invested, so that the house adds nothing to his salary nor to the current expenses of maintaining the university.

"Following is a statement of the sums for which warrants have been issued by the board, with the rate of interest which these warrants draw. The proceeds from the sale of these warrants have all been used or will be used in making the improvements noted above:

"For erection of Science Hall	$36,000.00
For erection of Mechanic Arts building	20,000.00
For equipment of Mech. Arts bldg., new boilers, tunnels, steam mains, new fuel room, etc.	20,000.00
For erection of president's house	16,000.00
Total	$92,000.00

—all drawing interest at 7 per cent except the issue of $16,000.00 for the erection of the president's house, which draws interest at 4 per cent. The legislature will be asked to authorize the issue of 4 per cent bonds in the sum of $92,000.00 for the purpose of funding these warrants. Such bonds, it is believed, can be sold at par. The income from the lands owned by the university and school of mines, will, in all probability, from the start be ample for meeting the interest on the proposed issue of bonds. If not, the deficiency should be paid out of the income of the university under the 2-5 mill act. The trustees, it will be observed, are not asking the state for a dollar of appropriation not already provided for. They are simply asking to be allowed to anticipate in a measure the future income from the land grant of the university for the purpose of making permanent improvements of which future generations of students will be the chief beneficiaries. To deny their request would be analogous to the action of a probate court in saddling upon an overburdened parent the expense of educating a minor child who is independently rich in his own right, but whose resources can not, without the court's consent, be used for such purpose. Before these bonds become due the income from the rental of the lands, together with the interest upon the proceeds of such of them as may have been sold, will constitute a sinking fund far more than sufficient to pay off the principal when due, besides taking care of the annually accruing interest on the bonds."

At present all but $16,000.00 of this floating indebtedness is bearing interest at 7 per cent, thus entailing a heavy drain upon the current income of the university, which without such drain would be barely sufficient for the proper maintenance of the University. It is hoped that the legislature will see its way clear to make a direct appropriation for the payment, if not of the entire indebtedness, at least of the larger part of it, and to provide for the funding of the balance at a much lower rate of interest. What the president of the university says in regard to the urgent need of the institution for additional buildings is fully concurred in by the members of the board of trustees, but the board feels that the first relief afforded by the legislature should be for the purpose of wiping out the floating indebtedness of the university. The university is growing rapidly in all its departments. The state would not have it otherwise. The institution, however, can not continue to grow unless the state shall be able and willing to provide from time to time additional buildings and equipment. Three expensive buildings are at present in process of construction at the State University of Iowa and there is hardly a state university in the country at which one or more new buildings are not always in process of construction. A state which is not able and willing to take care of its offspring in the way of educational and other necessary institutions confesses its unfitness for statehood. North Dakota has shown that she is thoroughly committed to the policy of maintaining a high educational standard, not only by providing with a fair degree of liberality in the past for existing educational institutions but by the creation, in the last six years, of two additional institutions of higher education. Several countries and many municipalities in continental Europe, with comparatively limited resources, devote a third or more of their entire income to the maintenance of their schools. Germany, whose growth in recent years has been far more rapid than that of any other European power and in many respects more rapid than that of the United States, spends the largest portion of its income of any European state in the maintenance of its schools. It has been the proud boast of North Dakota heretofore that her educational system and particularly her institutions of higher learning are inferior to those of no other state in the Union or in the world in proportion to her age and resources. The trustees of the University of North Dakota have entire confidence in the willingness and desire of the legislature to deal with the utmost generosity possible with all her state institutions of higher education, and leave the matter of the care of these institutions and particularly of that one of which they are the immediate custodians in the hands of the legislature with the assurance that a wise and liberal, rather than a short sighted and niggardly policy will be pursued by them. North Dakota is no longer a poor state. Wealth has been accumulated here at a rate rarely exampled in the history of commonwealths. The general fund of the state brings in annually enough to take care of all the ordinary expenses of administration and to provide with a fair degree of liberality for the growth of our higher institutions of learning.

Respectfully submitted,

Geo. E. Towle,
Pres't Board of Trustees.

PRESIDENT'S REPORT.

University, N. D., June 30th, 1904.

Honorable Members of the Board of Trustees of the University of North Dakota:

Gentlemen:—I have the honor to present herewith my report as president of the State University of North Dakota for the biennial period ending June 30th, 1904.

The biennial period just closing has been gratifyingly free from any serious illness on the part of the teaching force and student body of the university, has been entirely free from deaths, and, with the exception of the partial destruction by fire in December last of the Mechanic Arts building, has been free from any disaster to the institution. The adverse decision of the supreme court in the so-called bond case rendered necessary the severest economy in the expenditure of the income of the university during the latter half of the biennial period. As the result of this decision it was found necessary to postpone indefinitely the plans for building, which were for the most part matured, but which, fortunately, had not reached the point where any large expense had been incurred. The institution was left with a floating indebtedness of $92,000, the interest on which has been paid out of the current income of the institution. Some provision should be made at the coming session of the legislature to take care of the principal of this indebtedness. Most of it is at present running at such a hight rate of interest as to make a serious drain upon the current income of the university. As this indebtedness was incurred by the trustees in the erection of imperatively needed buildings and with the full expectation that the legislature at its next session would authorize, as it did, the issue of bonds based upon the university lands to cover this expenditure, I venture, by way of justification of the action of the trustees, to quote at some length from my last biennial report: "The buildings which have been erected during the past two years have relieved the most pressing needs of the university in the way of accommodations for the different departments. These needs were so imperative that the trustees were, in my opinion, fully justified in anticipating, as they have done, the action of the legislature in providing for these needs by the authorization of bonds to be issued against the university lands. The buildings erected during the past two years will, with proper care, serve the university for a hundred years to come. It is only fair, therefore, that the cost of these buildings should be charged against the permanent resources of the university. While a progressive institution of learning will always have urgent needs, there is perhaps no time in the history of such an institution when its needs are so urgent as in the early years, when, in the nature of things, the permanent plant of the institution has to be provided de novo. Anyone conversant with great manufacturing enterprises knows how great is their first cost. Buildings must be erected and machinery installed which succeeding years must pay for. It is only ordinary business sagacity, at this stage, to make ample provision for the future needs of the enterprise. Nothing in the long run is so expensive as makeshifts, and nothing is so surely indicative of a low order of business sagacity as to waste money in temporary makeshifts. The policy of the trustees in anticipating the future wants of the institution by a fairly liberal expenditure, rather than by a short sighted parsimony, is in keeping with the practice of our shrewdest business men and will certainly commend itself to the approval of our state legislators. The demand of the institution for more room was so imperative that it could not longer be deferred. The trustees would have been wholly unworthy of their sacred trust had they been deaf or indifferent to these urgent calls. Were the trustees to build at all, it was the highest economy to build for permanent use. They have incurred no expense which the state will be asked to pay for out of the general fund. They have incurred a floating indebtedness which the legislature will be asked to fund out of the ample resources of the university itself. As the result of the foresight of the trustees, the university is provided with a thoroughly up-to-date lighting, heating and power plant, which will be ample for many years to come and which can, with slight expense, be added to as occasion therefor may arise. The new Science Hall will be a suitable and adequate home for our science departments in all probability for the next decade at least. The same can be said of the new Mechanic Arts building."

Owing to the adverse decision of the supreme court in the bond case it has been impossible for the trustees to erect any new buildings during the last two years.

NEEDS OF THE UNIVERSITY.

The needs of the university in the way of additional buildings remain the same as two years ago. What I said at that time in regard to those needs possesses added emphasis at the present time. I venture, therefore, again to quote from my last biennial report what was then said in regard to the needs of the university: "A most pressing need of the university is for a combined assembly room, library and administration building. The seating capacity of our chapel is only about thirty-five per cent of the present attendance. Under the circumstances, attendance at chapel has, perforce, to be made voluntary. Perhaps nothing so marks a progressive institution of learning as a rapidly growing library. While our present library quarters answer fairly well for the housing of our present library, they will, in the natural course of the development of the university, soon be entirely inadequate. The present quarters of the president and secretary are entirely inadequate to the needs of those two important departments of administration and are, it is believed, more cramped than those of any other of our state institutions. The administrative work of the university is growing rapidly and more spacious quarters will soon have to be provided. Every inch of available room in the university is at present fully utilized and the only relief for the overcrowded condition of the assembly hall, library and the offices of administration will be through the erection of another building." The university has no vault and should a fire break out in the main building it is probable that all the records of the university from the beginning would be destroyed. Such a loss would be irreparable and almost incalculable.

There is a crying need, also, for additional dormitory accommodations. The university greatly needs at present two new dormitories, one for the accommodation of young women and one for young men. Three young men are at present in many cases occupying rooms 11x24 feet, each, in dimensions. Such overcrowding is not only demoralizing to discipline and prejudicial to health, but presents a condition highly unsuitable for the best intellectual work. In an older settled community it would not be difficult to induce people of moderate means to build boarding houses about a growing institution of learning; but in a new community like ours, where capital commands large returns, it is impossible to interest it in an investment, which involves no little personal attention and annoyance. The problem of housing and feeding a large student body in such a community as ours, where comfortable room and board outside the dormitories, even in the rare instances where they can be obtained at all, command a price beyong the means of the average student, is one of the most serious difficulties to be overcome in building up a young university in a pioneer state. I am not, however, prepared at present to urge the board to undertake the erection of the two needed dormitories. It is, perhaps, a question whether the university should at this time commit itself finally to an extensive dormitory system, great as the advantages of such a system undoubtedly are, not only in the way of the cheapest practical provision for housing and boarding the student body, but also in the way of building up a more distinctive student community with its resulting *esprit de corps* and a more strongly marked social life than would otherwise be possible.

There is, however, one expenditure in the way of improvement which appears to me most urgent. Both the main recitation building and Davis Hall were erected in the early territorial days, at a time when building methods were far more primitive than at present. The basement timbers in both of these buildings were placed on, or in near proximity to, the ground, with no provision for ventilation. As a result these basement and foundation timbers have become badly decayed. The superstructure walls of these buildings, with a suitable floor foundation, will last for many years. In the main building particularly and only to a less degree in Davis Hall the original flooring in all the rooms has become worn and splintered and is entirely unsuitable for present needs. The original plaster, also, like all the plaster of those early days in North Dakota, was of the poorest quality and has now become so broken and unsightly that it ought to be completely renewed. I would recommend, therefore, the expenditure, within the next year, of fifteen to twenty thousand dollars in placing suitable foundation timbers under both the main building and Davis Hall; in replacing the worn and splintered soft wood floors with hard wood floors, and in replastering both buildings with adamant or other hard plaster. North Dakota is not a poverty stricken state. Its state university should not, therefore, and need not, present an appearance which would not be creditable to the most primitive district school house on our prairies. With the improvements I have mentioned the university buildings will, throughout, present a creditable appearance and will be an object lesson in good housekeeping to our student body as well as a creditable exhibition of North Dakota's thrift and public spiritedness to the hundreds of visitors yearly from our own and other states.

Perhaps the most urgent need of all is for a university gymnasium. The small gymnasium which was maintained for some years in the attice of the Cottage has been rendered unavailable by the recent occupancy of that building by young women students. At present there is no room available in the university for gymnasium purposes. I greatly doubt whether any other institution in the country of the size and resources of the University of North Dakota has such an entire lack of facilities for physical exercise as has the university. Without a gymnasium, it is practically impossible for an institution to accomplish anything in general athletics or to develop such physique and general physical well-being on the part of the student body as is fundamental, not only to future success in life, but also to ordinary physical health. In many of our universities, the gymnasium is the most expensive building connected with the institution. While I am not prepared to urge the expenditure of a considerable sum of money for a gymnasium here at present, I would most urgently recommend that, say, $5,000.00 be expended next summer in the erection of a plain frame or brick building of suitable dimensions and arrangements for the purpose of physical culture. The need of a new gymnasium under the charge of a competent physical director is so imperative that it cannot longer be disregarded. It is believed that a building costing not to exceed $5,000 could be erected which would serve the purpose of a gymnasium for ten years to come and would then be available for other university purposes.

CHANGES IN INSTRUCTIONAL FORCE.

With the exception of Dr. Samuel Peterson, assistant professor in the departments of Political Science and Law, of Mr. Williams S. Hazelton, assistant professor in Engineering, of Mrs. May C. Peterson, instructor in English in our preparatory department, and Mr. R. B. Kennedy, commandant of cadets and physical director, who retire at the close of the present year, our instructional force remains intact. Mrs. A. B. Long, who has served for five years as housekeeper and for the last three years as proceptress as well, retired at the close of the last school year and was succeeded as preceptress by Miss Mary E. Donovan, a graduate of Carleton College, Northfield, Minn., and for some years a successful teacher in the high schools of Minnesota and Colorado. It has seemed expedient to separate the positions of preceptress and housekeeper and during the next school year the position of housekeeper will be filled by Miss Gwendolyn Stewart, a graduate of Leland Stanford University and of the domestic economy department of Pratt Institute, Brooklyn, N. Y. Both of these women come to us with the highest recommendations. Hon. Guy C. H. Corliss, who has served as dean of the College of Law since its establishment in 1899, has resigned the posision of dean, owing to the pressure of his private business, and his place will be taken by Professor Andrew A. Bruce of the law school. Dean Corliss's resignation involves no change in the instructional force of the law school, as Judge Corliss retains his professorship of law and Prof. Bruce becomes in name, as he has largely been in fact for the past two years, the dean of the school. It is a pleasure to note in this connection the substantial growth of the law school, which has now become one of the best known and most important departments of the university. Indeed, the annual number of graduates from the law department is now in excess of that from any of the other departments of the university, being for the school year 1903-4 twenty-four as compared with seventeen from the College of Liberal Arts and twenty from the normal college. It is a question whether the time is not near at hand when it will be for the best interest of the College of Law, as well as of the university as a whole, to extend the law course from two years to three years.

Dr. James E. Boyle, a graduate of the universities of Kansas, Nebraska and Wisconsin, has been appointed instructor in political science and history to succeed Dr. Samuel Peterson, who resigned his position at the close of the school year to accept a similar position in the University of Texas. Mr. Arthur J. Becker, a graduate of the University of Michigan, has been appointed instructor in engineering to succeed William S. Hazelton, who resigned at the close of the school year 1903-4 to accept an assistant professorship of engineering in the University of Michigan. G. J. Sweetland, B. A., M. D., a graduate of Hobart College, has been appointed physical director in place of Mr. R. B. Kennedy, resigned. The following promotions and additions to the faculty were made at the close of the school year 1903-4:

E. F. Chandler, M. A., was promoted from the assistant professorship of mathematics to be professor of mathematics; O. G. Libby, Ph. D., from the assistant professorship of history to be professor of history; G. W. Stewart, Ph. D., from the assistant professorship of physics to be professor of physics; Howard L. Schug, B. A., a graduate of the University of Michigan, was appointed instructor in Latin and German; Miss Gertrude Beers was appointed instructor in commercial branches; Mr. Luther E. Birdzall was appointed instructor in law.

At the close of the school year 1903-4 Prof. H. B. Woodworth, who has rendered the university most highly valued service as a professor in the university during the last nineteen years, resigned the professorship of history owing to advancing years and was made professor emeritus of history in the university.

The faculty now consists of fifteen professors, three assistant professors, and twenty-one instructors and lecturers, a total of thirty-nine members.

A DEPARTMENT OF DOMESTIC ECONOMY.

I wish to renew at the present time the suggestion offered to this board on more than one former occasion that there be established at the university a department of domestic economy. Already more than one-third of our student body is made up of young women and the proportion of young women in the entire student enrollment is increasing year by year. While many of these young women are preparing themselves to be teachers, they do not, naturally, look upon teaching as a finality. In all probability the great majority of our young women students will eventually marry and become housekeepers and home makers. Were it the tendency of coeducation to lessen the proportion of women in the community who marry, or to unfit them in any degree or way for marriage, coeducation would be an evil instead of a blessing. Certainly, if marriage is to be encouraged, the education of our young women, instead of unfitting them for home life, should fit them the better for such a career. Whether the housewife needs to do her own cooking and housekeeping or not, it is of the utmost importance that she know how to cook and keep the house. Only thus can she become an efficient director of hired help. It is the object of the teaching of domestic economy in our schools and colleges, not merely to give a practical knowledge of cooking and housekeeping to those whom it trains, but to elevate housekeeping into an art and to dignify both cooking and housekeeping by making the knowledge of its subject matter a science comparable to the science of medicine, of mining or of agriculture. The object of all industry and all activity being the enrichment of life, nothing taught in our schools should be of greater utility and dignity than the teaching of domestic economy to our young women.

Now that the university has as a housekeeper a woman not only of general culture and superior executive ability, but also of thorough training in domestic economy as taught in our best technical schools, I would renew the recommendation that, at the earliest practicable moment, a department of domestic economy be established here with Miss Stewart, our newly appointed housekeeper, in charge. It is not probable that it will be feasible to start such a department during the next school year. I shall, however, be glad if the trustees can see their way clear to giving me discretionary power to open such a department during the next school year if, after consultation with Miss Stewart, it should seem practicable to do so. I believe that such a department could easily be organized at an initial expenditure of from four to five hundred dollars and be maintained at an annual expenditure of from four hundred to five hundred dollars.

IMPROVEMENT OF THE UNIVERSITY GROUNDS.

Now that we have, for the first time, a superintendent of buildings and grounds, it becomes possible to do something on a considerable scale for the beautification of the grounds of the university. During the summer months the two teams belonging to the university, with their drivers, are left measurably free for work on the grounds. Under the supervision of an intelligent superintendent, they will be able to do much toward the improvement of the grounds. Following the suggestion made in my last annual report, the tennis courts and ball fields have been removed from the main campus to the plot of ground north of the Mechanic Arts building. Excellent tennis courts and an excellent ball field have been laid out there at the expense of the university. It was felt, not only that this was a reasonable concession to a most valued feature of the university life, but was due to the tennis and ball organizations in view of the fact that they had been dispossessed of their old grounds and equipment as a prelude to the general improvement of the campus. It is proposed, during the present season, so far as possible, to convert the main campus into a lawn. The bare portions will be seeded or sodded down and the grass, it is expected, will be kept short. This, perhaps, with the improvement of drives and walks, the removal of unsightly portions of the fence and a more systematic care and pruning of the trees than has hitherto been practicable, will be the most that can be accomplished during the present summer. I would suggest, however, that a serpentine walk be laid out following the coulee bank at about the level of the high water mark. This could be laid out and cindered during the present summer and next spring could be set on either side with a thickly planted row of Russian willows. This is a hardy tree and in the spongy and moist soil of the coulee bank there would be little trouble in getting small trees properly set to live. Thus, in a few years, we should have along the coulee bank a most attractive walk—one which would become not only a popular resort with students, but a real ornament to the grounds, a screen to the present unsightliness of the coulee, and a most serviceable windbreak against the prevailing and most trying winds of our winters. At Oxford University just such a walk, now known as Addison's walk, was made more than a hundred years ago and has since become famous as one of the greatest attractions of that beautiful seat of learning. In addition to such a walk as I have suggested, I would recommend that steps be taken during the summer looking to the setting, early next spring, of a row of trees, better a double row, along the east and south sides of the campus, as well as along the inside of our present board walks. In a recent visit to Casselton in this state I was greatly struck by its fine shade trees. Some of the early settlers in that village established the custom of liberal tree setting. As a result, today one can walk from end to end of any of the streets of Casselton along walks completely embowered in fine overarching trees. It would, possibly, be expedient on our own campus to set cottonwoods or other rapidly growing tree, alternating the same with elms, hard maples, mountain ash, North Carolina poplars, saw tooth birches and similar trees of comparatively slow growth, which will eventually afford sufficient shade so that the more rapidly growing cottonwoods and other brashy trees can gradually be removed. There is no reason why, with such treatment, the university campus shall not, a generation hence, be as fine as any school or college campus in the country. Our cottonwoods and box-elders have proved a great blessing to this country in the way of giving shade and shelter within the lifetime of the generation which first settled these prairies. They are not, however, trees possessing much beauty or natural grace and must eventually give way to the more standard shade trees of slower growth but of far greater natural beauty and of longer life. Steps should be taken another year, also, to plant creeping vines about our buildings. There are several varieties of the Virginia creeper native to this region which, if set about our buildings, would eventually cover them, thus relieving them of much of their present bareness and lack of architectural ornament. The impression which one who has spent some weeks in the summer at the great eastern or European institutions of learning brings with him upon returning to our own university in the fall, is one of painful contrast between the beauty of those institutions and the bareness, not to say ugliness, of our own. The University of North Dakota cannot, of course, in many years hope to possess buildings of great architectural beauty and of great costliness of material and construction, such as one finds at the great seats of learning in the eastern states and in Europe. But very much of the beauty of these places is due to their beautifully kept grounds, their fine old trees, and their vine covered walls. These attractive features can be acquired in the course of time at no great expense by our own state university. But it will be necessary for those now in charge to start this work of beautifying if the coming generations are to enjoy its fruits. Certainly the high educational influence emanating from a beautiful environment is universally conceded and if the University of North Dakota is ever to divert to itself the children of people of some wealth and culture in this state, who now go to eastern institutions rather than to their own university, for the alleged reason that they get there an "atmosphere" which can not be gotten here, it will be only when the University of North Dakota has been made beautiful to the eye through such a process of transformation as I am here urging. I believe that henceforth the university should build not less with reference to the architectural beauty than to the mere utility of the buildings to be erected. Not the least value of the new president's house, in my judgment, is due to the fact that it will forever render impossible the building upon our campus of any more unsightly structures. The ornamentation, already well begun, of the grounds about the president's house will set the standard for all other portions of the university campus. The university is already one of the objective points, perhaps the first objective point, to which citizens of Grand Forks take friends and strangers when they come to the city. If these visitors shall carry with them to remote parts of the state and of the country favorable impressions and flattering reports of our external appearance—for that is all the most of them see of us—it will prove one of the most effective advertising agencies which the university can maintain. But, after all, the real object of such beautification as I have urged is its educational uplift upon the great body of the youth of North Dakota, who will, in increasing numbers as the years go by, resort to our halls for their education. The taste for natural beauty which will thus be cultivated here will be carried into the state at large and may yet be the instrument of transforming North Dakota from a region of barrenness into one of the most attractive of our western states. The only practical remedy against the monotonous flatness of our state will be the universal planting of trees and shrubs along our roadsides and about our farm buildings.

SUMMER SCHOOL.

Last year a very successful summer school for the three counties, Grand Forks, Walsh and Pembina, was maintained at the university, with Professor Joseph Kennedy in charge. The university contributed so much of all rents arising from the summer school as should be needed, these rents going to pay the salaries of university professors who did work in the school. This year another session of the summer school, beginning July 5th and closing August 2nd, will be conducted by Professor Kennedy at the university. These summer schools are proving highly useful to the teachers of the state by placing at their disposal the library, laboratories, the museum and a part of the teaching force of the university at a time when they would otherwise be idle, and are proving highly useful to the university by bringing here the teachers of three of the most populous counties of the state and sending them away again after a season thoroughly loyal to the university, which has become to them a sort of Alma Mater. It is proposed this year to place at the disposal of the summer school the entire plant of the university free of charge to the summer school. Several of the best known principals and some of the well known county superintendents of the northeast portion of the state will constitute, with a few of our own instructors, the faculty of the summer school. The attendance last year was 186. It is expected that the coming session of the summer school will have an attendance as large as or larger than last year's school.

ATTENDANCE.

Analysis of Attendance for the School Year 1901-2—

	Men.	Women.	Total.
Graduate department	9	2	11
College of Arts	46	18	64
College of Engineering	14	..	14
Normal College	16	117	133
Preparatory department	69	16	85
School of Commerce	24	16	40
Special	6	1	7
College of Law	18	..	18
Totals	202	170	372

Analysis of Attendance for the School Year 1903-4—

	Men.	Women.	Total.
Graduate department	4	2	6
College of Liberal Arts	61	19	80
Normal College	14	99	113
College of Mining Engineering	12	..	12
College of Mechanical Engineering	20	..	20
College of Law	50	1	51
School of Commerce	61	25	86
Preparatory department	80	48	128
Summer school	19	167	186
Totals	321	361	682
Totals exclusive of summer school attendance	302	194	496

A notable feature of the attendance during the past year as in all recent years was the gratifying increase in the attendance of the upper classes. The enrollment of students of college grade for the school year 1903-4 was 215 as compared with 134 for 1901-2. The freshman class was much the largest in the history of the university being 75 for the school year 1903-4 as against 38 last year and 36 the year before. Another gratifying feature of the attendance at the university is the ever increasing numbers coming to us each year from the high schools of the state. Of the enrollment in the freshman class for the school year 1903-4, 33 came to us from the high schools of the state and 25 from our own preparatory department. There are at present sixteen high schools in the state maintaining a four years' high school course and fitting students for the freshman class of the state university. This number is likely to increase rapidly in the near future and it is hoped that the time is near at hand when it will be possible for the university to begin to cut off, one class at a time, its preparatory department. Such a step would work to the advantage of the university in many ways. It would remove from the high schools all trace of the feeling now existing in some quarters that the preparatory department of the university is in a sense a competitor of the high schools of the state. There is little ground for this feeling, inasmuch as the university discourages in good faith the attendance of students from towns in the state maintaining a good high school. With the exception of Grand Forks, there are few towns in the state maintaining a high school which send students to our preparatory department. Again, a university maintaining a preparatory department suffers somewhat in its standing among other colleges and universities which do not maintain such departments. Furthermore, the presence at the university of students of college grade and preparatory grade complicates the matter of discipline, as there are important reasons why younger students should receive a somewhat more rigid supervision than students of college grade. Both classes, however, live together in the dormitories and it is impracticable to impose different sets of rules for different classes of students living in the same building. It will not, however, be advisable to drop our preparatory department in toto, probably, for several years to some. In the main, our preparatory department serves a class of students who live at a distance from towns maintaining a high school and who, but for our preparatory department, would go to other institutions maintaining such departments rather than to the high schools in this state. They would thus be lost permanently to the university. Some of the considerations which have been recited in favor of cutting off our preparatory department apply with equal force to our normal department. There is a feeling in some quarters that the university ought not to enter into competition with the other normal schools of the state for the training of normal students. While this feeling is, perhaps, natural, it is not very reasonable. The normal department at the university was established by law many years before either of the other schools was established. Its legal status is, therefore, fully as good as theirs. There are, moreover, many advantages pertaining to a normal school maintained at the state university, which are not possessed by normal schools maintained independently. Our normal students enjoy the privilege of access to our extensive laboratories, library and museums, as well as the privilege of taking work, if they so desire, in the classes of the several colleges which go to make up the university. Most of the states maintain several normal schools and there is already talk of establishing a third normal school in this state. Certainly, it were far better for the state from every point of view to retain the normal college at the university than to start an independent normal school in another part of the state. It would be far cheaper for the state to pay the expenses of students travelling between their homes and any of the normal schools at present established than to equip and maintain a separate normal school. When the university cuts off its preparatory department, it will doubtless cut off its preparatory normal classes as well, and when that is done it will be time to consider the advisability of changing our present normal college into a college of education, corresponding in grade with our present colleges of liberal arts and of engineering. Graduation from such a college would, of course, carry with it a degree; professional in character, but corresponding in value to our present bachelor's degree either in the College of Liberal Arts or in the colleges of engineering.

THE STREET RAILWAY.

The proposed street railway connecting the university with Grand Forks is already assured and work upon it will be begun at once. It is hoped to have the line in operation by the opening of the fall term. The new motor line will, it is believed, prove of almost incalculable value to the university by putting it in cheap and easy communication with the city. The distance of the university from Grand Forks and the great difficulty, during the greater portion of the year, of getting back and forth has proved, heretofore, a serious handicap to the institution. Henceforth the university will enjoy all the advantages of isolation with the added advantage of being practically in the heart of a considerable city. With the construction of the new railway line the town will doubtless grow toward the university and there will, in a few years, be an abundance of comfortable boarding places in the immediate neighborhood of the university for the accommodation of students. The lack of such accommodations, heretofore, has been one of the most serious difficulties in the way of building up the university. Not the least advantage of the new line will be the possibility of bringing the townspeople to lectures of a literary or scholarly character, convocation addresses, class plays, receptions and other forms of entertainment at the university as well as of making similar attractions of an instructive and social character in Grand Forks more easily accessible to the students living at the university. In time, it is hoped, the professors will build themselves homes about the university campus and there will thus grow up here a distinctive university community. Heretofore there has been no contact, practically, between the great mass of the studen body and the professors in their homes. In other institutions differently situated the pleasant social mingling of the students in th home life of the professors and instructors has been one of the mos delightful and profitable features of the institutional life.

THE WORK OF THE LITERARY, RELIGIOUS AND OTHER ORGANIZATIONS

The work of the four excellent literary and debating societies o the university has continued during the last biennial period of th same high character as in former years. Each year a series of intersociety debates is carried on between the societies and from the team participating in these debates are selected the teams for intercollegiate debates. Last year the team representing the university wa successful in the debating contest with a team representing the University of Manitoba. These intersociety and intercollegiate debate are, it is believed, among the most useful activities of the universit although they are only an episode in the literary work maintaine by our debating and literary societies throughout the year.

For several years past a lecture course has been maintained by th university, the lectures being given on successive Saturday evening throughout the school year. Last year it was deemed wise, in vie of the fact that the university has no suitable place for holding chape exercises, to do away with the daily chapel exercises and to introduce in its place a weekly convocation exercise at which the entir student body should be brought together so far as the limited capacit of our assembly hall should permit. At these weekly convocatio exercises a half hour's address is delivered by some speaker of recognized standing. The speakers during the last school year were a follows:

September 26th—President Webster Merrifield, University.
October 3rd—Rev. Dr. Parks, Atlanta, Ga.
October 10th—Senator P. J. McCumber, Wahpeton.
October 17th—Congressman B. F. Spalding, Fargo.
October 24th—Professor Joseph Kennedy, University.
October 31st—Professor Vernon P. Squires, University.
November 7th—Rev. Herman P. Fisher, Crookston, Minn.
November 14th—Rev. A. C. Stevens, Grand Forks.
November 28th—Col. J. D. Benton, Fargo.
December 5th—Pres. George A. McFarland, Valley City Normal
December 12th—Pres. J. H. Worst, State Agricultural College.
January 9th—Hon. W. L. Stockwell, State Superintendent o Public Instruction.
January 16th—Bishop John Shanley, Fargo.
January 23d—Miss Eleanor Gordon, Fargo.
January 30th—President Joseph Carhart, Mayville Normal.
February 6th—Supt. D. F. Bangs, State School for the Deaf.

February 13th—Pres. E. P. Robertson, Red River Valley University.
February 20th—Dean P. G. Knowlton, Fargo College.
February 27th—Prof. Gottfried Hult, State Agricultural College.
March 5th—Superintendent P. S. Berg, Larimore.
March 12th—Bishop Cameron Mann, Fargo.
March 19th—Professor Andrew A. Bruce, University.
April 9th—Judge Guy C. H. Corliss, Grand Forks.
April 16th—Father E. J. Conaty, Grand Forks.
April 23rd—Professor G. St. John Perrott, University.
April 30th—Hon. B. S. Rusesll, Jamestown.
May 21st—President W. E. Hicks, State Manual Training School.

Among the literary activities of the student body is the monthly publication of *The Student,* the literary exponent of the student life of the university. At the close of the school year 1902-3 the members of the junior class published a most creditable volume reflecting the activities of the student body in all departments and known as *The Junior Annual.*

Beginning with the last school year the faculty of the university publishes a quarterly known as *The University Bulletin.* Each issue of *The Bulletin,* besides giving much valuable information in regard to the work of the university, contains one or more papers, scholarly in character, by some member of the faculty.

Branches of the National Association of the Y. M. and Y. W. C. A. for colleges are maintained at the university and are doing a most valuable work. Under the auspices of these associations student prayer meetings are conducted each week and several classes for the study of the Bible are successfully maintained. Each Sunday evening a joint meeting of the Y. M. and Y. W. C. A. is held in the parlor of one of the dormitories, at which an appropriate address is given by some member of the faculty or by an invited speaker. A most important activity of these societies is the looking after the comfort and welfare of the new students and the welfare of wayward students.

All the usual forms of athletic sports are maintained at the university, including baseball, football, basketball, tennis and track athletics. These sports are under the general direction of the University Athletic Association. The active manager is a member of the faculty and thus these activities are kept under close faculty control. In spite of many conceded abuses, which are, however, being gradually eliminated, college athletics are year by year gaining a firmer foothold in our institutions of higher learning. In the opinion of those most competent to form a judgment, they play a most valuable part in the general discipline of the institution. Their objectionable features will gradually be eliminated and their good features will be retained and promoted as the advantages of college athletics come to be more generally recognized and a more rigid cotnrol comes to be maintained over them.

The social life of the institution is carefully cultivated, not only through the regular Saturday evening receptions in the parlors of the dormitories and through frequent receptions and banquets given by one college class or society to another, but also by the occasional receptions and other social and literary functions given to the student body at the homes of the president and members of the instructional force. By the closer union of the town and university, which it is believed will result from the new trolley line, it is hoped that these latter features of the social life at the university will be greatly promoted.

Since my last biennial report there has been little or no call for the exercise of formal discipline. For the last two years the students in the young men's dormitory have governed themselves through a system of self elected proctors. While the plan has not proved ideal, it is felt, both by the faculty and the young men concerned, to be a great improevment over the old system of discipline by a resident instructor. These young men will soon be called upon to govern themselves as citizens in the several communities of this state and the practice in self government acquired at the university is likely to prove a valuable, if not an invaluable, preparation for the large measure of self-government which will fall upon them in after life. Our young men and young women come mainly from the farms and are very largely self-supporting. They have, therefore, neither time nor money to waste in frivolous or vicious dissipations.

Respectfully submitted.

WEBSTER MERRIFIELD.

APPENDIX I.

REPORT OF THE DEAN OF THE COLLEGE OF LIBERAL ARTS.

UNIVERSITY, N. D., October 15, 1904.

To the President of the University.

SIR:—I have the honor to submit herewith my second biennial report as dean of the College of Liberal Arts.

INSTRUCTION.

The courses of study pursued by undergraduate students during the academic year 1902-1903 were given in my former report. The following list includes the courses pursued during the academic year 1903-1904.

Biology—

V. Protoplasm, cells and tissues; invertebrate and vertebrate zoology.
VI. Animal histology; embryology.

Chemistry—

I. General chemistry; qualitative analysis.
II. Quantitative analysis.
III. Metallurgical chemistry.

Education—

III. Study and discussion of modern educational problems.
IV. The history of education; the science and problems of education; the philosophy of education.

English—

I. Advanced rhetoric and studies in literary form and interpretation.
II. Early English literature and Chaucer; Elizabethan literature; the literature of the seventeenth century.

III. The literature of the eighteenth century; the romantic poets; the literature of the Victorian age.

French—

I. Grammar and reader; conversation, composition, and translation of easy authors.
II. Study of the subjunctive mood; conversation and composition; Mlle. de la Seigliere, Le Bourgeois Gentilhomme, and Athalie, as prepared class work with as much reading at sight as can be accomplished.
III. L'Avare, Le Monde ou l'on s'ennuie, Hernani, and composition as prepared class work; conversation and sight reading; lectures on the development of the French language and literature.

German—

I. Schmitz's Elements of the German Language, Parts I and II; Gluck Auf; conversation, composition and sight reading.
II. Keller's Second Year in German; Der Neffe als Onkel; composition.
III. Faust, Part I; Koch's Deutsche Literaturgeschichte and lectures on the history of German literature; conversation and composition.

Greek—

I. First Lessons, composition and Book I of Xenophon's Anabasis.
II. Xenophon's Anabasis, Books II, III and IV; Homer's Odyssey; composition.

History—

III. History of civilization in the middle ages; English history.
IV. American history.
VI. The development of political parties in the United States and the economical and constitutional aspects of national growth to 1830.
VIII. American history and civics.

Latin—

III. Cicero's orations, and composition.
IV. Vergil's Aeneid, and composition.
V. Cicero De Senectute, Livy and Ovid; composition.
VI. Horace's Odes, Satires and Epistles; Quintilian, Book X; Roman antiquities; history of Roman literature.

Mathematics—

I. Higher algebra; trigonometry; analytical geometry.
II. Analytical geometry; differential and integral calculus.
III. Surveying.

Mechanical Engineering—

I. Mechanical drawing and shop-work.
II. Descriptive geometry.

Mineralogy—

I. Study of the properties, uses, distribution, and methods of determination of the more important minerals.

Philosophy—

I. Logic, psychology, ethics.
II. Hibbin's Problems of Philosophy, followed by the study of of the works of Plato, Aristotle, Descartes, Berkeley, and Kant.

Physics--

I. Heat, magnetism, electricity and light.

Political and Social Science—

I. Economics; money and banking.
III. Ethnology, anthropology, sociology and socialism.

Scandinavian—

I. Norwegian grammar and reader; Bjornson's Englad Gut; Lie's Den Fremsynte; conversation and written exercises.
III. Ibsen's Peer Gynt; Tegner's Frithjofs Saga; Broch and Seip's Literatur-historie with lectures on the Scandinavian languages and literatures; conversation and written exercises.

Spanish—

I. Spanish grammar and reader; conversation and written exercises.

ATTENDANCE.

In my former report I expressed regret that the attendance in the College of Liberal Arts had not increased commensurately with the attendance in other departments of the university, and added that the explanation seemed to be that, since the establishment of other colleges in the university, many had entered them who, under former conditions, would have entered the College of Liberal Arts. I am now pleased, however, to say that the retardation of the growth of the college was only temporary. The enrollment of 1903-1904 was twenty-five per cent larger than that of the previous year.

The annually increasing number of those who come to us as graduates of the rapidly growing and splendidly developing high schools of the state is cause for special gratification. More and more of these graduates enter without conditions, and some even with advanced standing.

The number of young ladies in the college in 1903-1904 was, as in 1902-1903, a little less than twenty-five per cent of the total enrollment. As the young ladies form a large majority of the graduates of our high schools, the conclusion seems irresistible, for this state at least, that, while more girls than boys complete a high school course, a much larger proportion of the male than of the female graduates of the high schools are not content with a high school education.

BACHELOR OF ARTS.

During the past two years, the requirements for the degree of Bachelor of Arts have been somewhat modified. The former requirements were two courses in English, two courses in some one foreign language, one course in philosophy, one in history, one in botany for those who entered without botany, one in chemistry for those who entered without chemistry, one in political science for young men who entered without political science, and a sufficient number of electives to make a total of sixteen full, or year, courses. Under the modified requirements, the degree is awarded to students who have a total of 48 "units" to their credit, a "unit" being the credit given for the completion, in a passable manner, of a term's work in one subject. Of the 48 units, at least eighteen, or six courses of study, are required; the rest are elective. The required courses are one in English, one in philosophy, two in some foreign language, and one from each of the following groups:

Group I—

History.
Political Science.

Group II—

Botany.

Zoology.

Chemistry.
Geology.
Mineralogy.
Physics.

The problem of how to shorten the time required to obtain the bachelor's degree, without lessening the degree's educational value—a problem to whose solution college authorities have devoted much thought in recent years—the faculty has endeavored to solve in two ways. First, it considers the quality as well as the quantity of a student's work in determining his fitness for graduation. Under a system of special honors and extra credits for quality of work, which was adopted in the spring of 1903, a student doing excellent work in all his classes is able to obtain the degree in three years, taking only four courses of study each year. In other words, the extra credits which may be secured by doing work of a high grade in twelve courses, equal the credits given for merely passable work in four courses.

Secondly, a student may elect, and count towards the degree of Bachelor of Arts, seven of the courses required for an engineering degree, or the equivalent of four courses from the courses of instruction offered in the College of Law. This privilege places it in the power of the student to shorten the time required for the completion of a liberal and a professional education, and tends, we believe, to induce a larger number of students to lay, in a liberal education, a broader foundation for their strictly professional studies.

I may add that three of the fourteen members of the graduating class of 1903 and four of the seventeen members of the class of 1904 chose their electives in the College of Law, and that in the colleges of engineering some have taken, and others are planning to take, the B. A. degree in addition to their professional, or engineering, degree.

Respectfully submitted.

George S. Thomas.

APPENDIX II.

REPORT OF THE DEAN OF THE NORMAL COLLEGE.

To the President of the University.

Sir:—I beg to submit the following report of the Normal College of the State University for the biennial period of 1903 and 1904.

ATTENDANCE.

The attendance has been about 130 each year. The number graduating from the Normal College in June, 1903, was twenty-two and in June, 1904, twenty. Some of these graduates have gone on and finished the liberal arts course and nearly all are engaged in teaching in this and neighboring states. The intention to engage in teaching is made a test and requirement for enrollment in the Normal College.

HISTORY AND PURPOSE.

The Normal College was created at the same time as the College of Liberal Arts by the territorial assembly in 1883. Its aim is to prepare teachers for the schools of the state. Every great institution of higher learning has an institutional agency of some kind and name for this purpose. I feel sure that the Normal College has, within the last two years, reached a higher degree of efficiency than at any previous time. It has now a strong and well correlated curriculum and, as the attendance and number of graduates indicate, is supplying a demand and doing a most important work in the state in the way of preparing teachers and maintaining a high standard of qualification.

ITS FUTURE.

As the university eliminates its preparatory department, the Normal College will probably undergo corresponding changes. But there should be evolution and not revolution—construction and not destruction. Whatever changes may become necessary with growing and advancing conditions, the state university should provide a home for the teaching profession and give to teachers an opportunity to prepare themselves for the higher schools of the state. There should be in the state a normal college and the most appropriate place for such a college is the state university.

THE CURRICULUM.

The curriculum of the Normal College is now as follows:

1. Rhetoric.
2. Algebra.
3. Drawing, Music and Elocution.
4. Psychology and Study of Education (Education I).
5. Literature.
6. Geometry (Plane and Solid).
7. Physics.
8. The Science of English Grammar, Commercial Geography, and Science of Arithmetic (Education II).
9. Civics and Ancient History (History II).
10. English History and American History (History IV).
11. Advanced Rhetoric (English I.)
12. Nature Study.
13. Logic, Psychology and Ethics (Philosophy I).
14. Modern Educational Problems (Education III).
15. History, Science and Philosophy of Education (Education IV).

(Each of the above subjects runs through the year.)

Electives—

In addition to the foregoing fifteen required courses a student must, in order to graduate, take a sufficient number of elective courses to bring his total up to sixty-three credits; a credit being a term's work in a subject done in merely a passable manner. He may make credits by doing better than passable work. (See catalogue for 1904.)

FOR HIGH SCHOOL GRADUATES.

Graduates of first-class high schools, if they have completed all the work prescribed by the state high school board or its equivalent, may complete the normal curriculum and receive the normal diploma on the completion of the following two years of work:

Junior Normal Year—

1. Education I.
2. Education II.
3. American History and Civics.
4. English I.

Senior Normal Year—

1. Philosophy I.
2. Science (Nature Study).
3. Education III.
4. Education IV.

WINTER AND SUMMER SCHOOLS.

During the last two years an excellent opportunity has been given to teachers in the winter and summer schools, either to review and advance their grade or to do work toward the completion of the regular course. The summer schools have been held under the joint auspices of the university and Pembina, Walsh and Grand Forks counties; and besides members of the regular faculty, some of the best outside talent obtainable was secured on the instructional force.

NO EXTRA COST.

The extra cost to the university and to the state, of a normal college is but little, if anything. The courses in education which are given and required of normal students and constitute the *differentia* of the normal college, would and should, in any university of good standing, be offered as electives. A student in any of the other colleges may now take the courses in education as electives; but when a student declares it his intention to become a teacher, and completes all the courses in education and also the other courses outlined above, he has finished the work of the normal college and is given, under the law, the normal diploma.

Respectfully submitted,

JOSEPH KENNEDY.

APPENDIX III.

REPORT OF THE DEAN OF THE COLLEGE OF MINING ENGINEERING (SCHOOL OF MINES).

To the President of the University.

ORIGIN AND OBJECT.

Agreeably to the provisions of an act of the first state legislature, approved March 31, 1890, the School of Mines was established as a department of the university for the purpose of giving instruction in chemistry, metallurgy, mineralogy, geology, mining engineering, mathematics, mechanics, drawing, milling, and kindred branches.

To provide for the School of Mines the United States government granted 40,000 acres of land. The wisdom of this act is manifest in that it makes provision for a technical education in an industry which is, perhaps, second only to that of agriculture in importance in the building up of a commonwealth. The rapid development of our resources has resulted in a demand for the most skillful and best trained specialists our schools of mines can produce. Those seeking the services of such young men will not be compelled to go outside our own state for them. Nor will our young men who wish to fit themselves as mining engineers, metallurgists, industrial chemists, etc., be forced to go to eastern states, at much greater expense, to secure such an education.

I quote the following extracts from an article which recently appeared in *The Student:* "When in 1890 the federal government established the School of Mines and granted to the state 40,000 acres of land for its maintenance, it exercised a forethought which will prove of incalculable value to the youth of the commonwealth. North Dakota is a great agricultural state and will always remain so, but its mineral resources will sooner or later prove themselves of immense value to the state. The federal government recognized this, and it further recognized the fact that trained men were necessary for the development of these resources, that trained men alone could develop them.

"A large area in the western portion of the state, covering probably more than 25,000 square miles, as demonstrated by the geological survey, is underlaid with coal. * * * Already in 1901, more than $407,000 worth of coal was mined in the state, but there is no reason why this should not be increased twenty-fold. Another almost unlimited resource of North Dakota is building stone. Scattered over the state are deposits of the finest sandstone awaiting scientific development. * * * Nor is this all. Those who visit the St. Louis fair will be surprised to find in the North Dakota booth in the Mining Building an array of the finest white stone china and table ware of every description, equalling the best English make. They will find ornamental ware, vases and jardinieres decorated in the highest art, and all made from the undeveloped North Dakota clays. Within our borders are to be found some of the finest pottery clays in the United States. But these are awaiting capital and talent for their development. With fuel close at hand, unexcelled opportunities are offered for the establishment of stone ware and sewer pipe industries. * * * And these are only a few of our undeveloped mineral resources. No one can longer maintain but that the opportunities for talent and capital are worth investigating and developing. And none can doubt the wisdom of those who provided a school for the training of men to develop them. * * * Yet these are not the only reasons why a school of mines is maintained in the state. The North Dakota youth as he grows up, may aspire to something different from what the state offers. He may wish to share in the many opportunities afforded by the great Northwest in the development of industries connected with mining. And it is only proper that his own state should give him such an education as he may find necessary to enable him to avail himself of such opportunities. The parent rightfully demands that our educational system be so broad in its scope that it can provide a training which will qualify his son to fill well whatever profession he may choose wherever fortune may lead him to practice it. The far-sighted man can not help but see what this vast field has in store."

The School of Mines of the University of North Dakota aims to give a strong technical and practical training which will fit young men to fill successfully important positions in the various branches of the mining industry. This is made possible in a large way on account of the connection of this college with the university. Here every mining student has all the advantages of a university with its specialists in the various departments of instruction, with its library, its well equipped laboratories and machine shops. The close affiliation between the mechanical engineering department and the School of Mines is mutually very helpful, as in many of the subjects the students in both colleges work together. All these helpful conditions rarely exist except in those cases where the school of mines is connected with the state university.

The past two years have been exceedingly successful so far as the work of the School of Mines is concerned. The men who have been in attendance have taken up their studies with real energy and have manifested a commendable interest in the work of their chosen profession. The curriculum outlined in the last catalogue has been rigidly followed and this has brought one class of students to their senior year.

The work of instruction in the College of Mining Engineering falls under several departments. The foundation and bulk of the work, however, is given by the departments of chemistry and metallurgy and geology and mineralogy. The course of study which has been outlined, while embracing the more important technical subjects of the mining engineer, includes also a number of subjects which add breadth and versatility. I believe that the university has reason to feel proud of the start which has been made in the School of Mines so far as the courses of instruction and the students are concerned.

The courses of instruction have been somewhat modified during the past year so as to add slightly to the mathematics and the technical subjects. Optional groups have been outlined, one emphasizing the ordinary mining engineering work, another the civil engineering side, and a third the geological side of mining engineering. These changes will doubtless materially enrich the work of the college and make it much more attractive to young men who have heretofore been compelled to go out of the state for such instruction.

There has been very little effort made by the University to advertise or to build up the School of Mines, yet the announcement of its beginning has resulted in bringing to it during 1903 and 1904 about twenty of our most worthy students. Several from the arts course have been taking elective work from subjects offered in the College of Mining Engineering. This is certainly a good beginning for a technical school of this character.

Students are encouraged to take the course in liberal arts before taking up their mining engineering courses. This will result in securing some very excellent graduates from the College of Mining Engineering. Our ambition is to send out young men who are well equipped and who will do themselves and the university honor. These young men are taking this course to fit themselves for the active occupations of life and expect to enter upon their profession immediately after graduation in the same way as do the graduates of a medical school. Under such circumstances it is a duty which the university owes these young men to give them the best she possibly can.

The most serious handicap under which this college is now working is the lack of equipment. It is to be hoped that in the future more liberal provision will be made for the School of Mines than there has been in the past.

EXPERIMENTAL AND TESTING DEPARTMENT.

Besides the technical instruction in the courses of mining engineering, surveying, geological engineering and other associated subjects, an important part of the work of the School of Mines is in what may be called its department of experimentation and economic development. This department takes up all kinds of practical investigations of the mineral resources of the state with a view of proving by actual tests their economic value as well as the best methods for their utilization. These investigations require a large amount of time as well as much equipment. A great deal of such work has been done by the dean of the College of Mining Engineering on the practical utilization of the coals and clays, building stones and other mineral products of the state. During the past year an unusually large amount of such work was done in preparing the state's mineral display for the St. Louis exposition. In this way the School of Mines has been instrumental in demonstrating not only to the citizens of the state but also to the people of other states, that there are vast deposits of a variety of minerals the value of which has hitherto been but little appreciated.

The hope is to make the School of Mines a department from which the people of the state may secure practical tests or any other aids which can be given to help in the development of our mineral resources. More funds are needed for the testing plants and equipment along various lines. There are few people who appreciate the great value of these undeveloped resourcesc or the enormous advantage which might be derived by successfully building up manufacturing and mining industries in an agricultural region. Such service will always be an important feature in the work of the School of Mines.

In the following outline the scope of the College of Mining Engineering will be more clearly seen.

Metallurgical Chemistry. The student is at first given a general survey of the principles involved and the methods employed in metallurgical chemistry. After that the following subjects are considered more fully: Fuels, including the composition, characteristics, uses and value connected with metal working and as steam and heat producers; refractory materials; furnace slags; cast and malleable iron and steel, their properties, impurities, methods of production, uses, etc. In a similar manner are studied the methods of production, chemical and physical properties, impurities and treatment, uses and value of copper, lead, tin, zinc, aluminum, etc. Connected with this, systematic chemical and physical tests are carried on illustrating the various grades of the metal under consideration.

This course is intended to give a clear and practical knowledge of common metallurgy. Later in the course the student is given several of the most important ores, and after a study of the chemical character of the ore he determines for himself the best method of treatment. He then makes an actual furnace trial on a small scale and after securing his resulting metal carefully determines the efficiency and economy of the method he has adopted. In this way the pupil gains a working knowledge of the fundamental principles employed in all the large metal works and smelters.

Assaying and Ore Treatment. This course is intended primarily for those taking the course in Mining Engineering, but may be taken as elective chemistry by students in the College of Arts. Assaying includes lectures and laboratory work in the various methods of assaying the ores of gold, silver, copper, lead, tin, antimony, iron, etc.; also the processes of gold and silver bullion analysis employed by the United States mint.

Ore treatment includes sampling, milling, roasting, concentrating, lixivation, amalgamation, chlorination, and the cyanide and electrolytic processes.

General Geology. This course, which extends through the year, is designed to present to the student the fundamental principles of geology. It includes the study of dynamic, structural, stratigraphic and historical geology by means of lectures, text books and laboratory work. Excursions are made to points of interest in the vicinity.

Mineralogy (Two-thirds). This course comprises the study of the properties, uses, distribution and methods of determination of the more important minerals. During the first part of the fall term crystallography and physical mineralogy are considered and the student becomes familiar with crystal forms by means of models and well crystallized specimens. The work in blowpipe analysis begins in the middle of the fall term and continues through the remainder of the year in connection with the lectures on descriptive mineralogy.

Economic Geology I (One-third). The nature and origin of ore deposits are considered as well as the distribution and occurrence of coal, gas, oil, clays, building stones and other non-metalliferous products.

An additional course in economic geology, comprising work for half a term, will also be offered to students who have completed the courses in general geology and mineralogy and desire to pursue further the subject of economic geology.

Petrography. This course is offered to those students who have taken Courses I and II in geology and mineralogy. The work in petrography extends through half a year, and together with summer field work counts as a full course. The determinative mineralogy of the rock-making minerals is considered, with special reference to their optical properties, and later the composition, structure, origin and classification of rocks is studied.

Physics I, General. Experimental lectures, recitations, laboratory experiments, and written reports. A knowledge of plane trigonometry is required.

First Term—Mechanics and Heat.

Second Term—Electricity and Magnetism.

Third Term—Sound and Light.

Text: Watson's A Text-book of Physics.

Manual: Miller's Laboratory Physics.

Physics II, Applied Electricity. First and Second Terms—Electricity and Magnetism. This is advanced laboratory work in electrical measurements. Students prepare written laboratory reports, in which special emphasis is laid upon the theory involved and the discussion of results. Parr's Practical Electrical Testing, supplemented with additional instructions and experiments, is used as a laboratory manual. A knowledge of differential and integral calculus is highly desirable. This course is open to those that have completed Course I.

Third Term—Applied Electricity. A lecture course planned to cover the essential features of the applications of electricity. It includes a study of direct and alternating current machinery, power, transmission, traction, lighting and other industrial applications. Norris' Electrical Engineering Lecture Outlines is used as a basis.

Surveying I. This course is made up of theoretical and practical work in the principles and methods of elementary surveying. A large number of problems are given in field practice involving the use of chain and tape, compass, level, transit and the subsequent office work and computations.

Surveying II. This course is an elective for those in the Mining Engineering course. The work is a continuation of Course I, but designed to give much field work in connection with mine surveying problems such as tunneling and laying out underground work, platting for mills, water power and a variety of other work. This course may be elected instead of machine designing in the fourth year.

Topography. A short course is given in plane table, transit and stadia work, the construction of topographic contour maps, etc.

Sanitary Engineering. An outline of the fundamental principles of hygiene and sanitary science, heating and ventilating, water supplies and purification of waters, drainage, sewage, etc. This course is given jointly by the departments of biology and chemistry. Credit, one-third course.

Building Materials. A brief study is made of the character, composition, properties and uses of building stone, brick, refractory products, cements, etc. This work is given by the department of chemistry and metallurgy and counts as a fractional course.

Mining Engineering. This course covers a wide range of subjects such as prospecting and locating, developing deposits, tunneling, timbering, sinking shafts, hoisting and transporting and locating, constructing and operating mining plants. The course requires a large amount of original work. It is closely connected with the summer field work and in connection with the thesis utilizes the field data as well as much of the general information gained through the various subjects in the curriculum. The work closes with a careful report on a mining property, embracing valuation, methods of development, and full plans for a complete mining plant suited to the treatment of the ore under consideration.

FIELD WORK IN MINING.

At the close of the second and third years, during the summer vacation, students are required, as part of the course, to spend three weeks in some mining region for the purpose of studying the geological conditions, mineral formations, the work of mining, milling and reduction. The time will be spent under the direction of the professor in charge. All of the geological and mineral conditions of the region will be carefully studied, as well as all the methods of mining and ore treatment. Notes, sketches and reviews will be required of each student and while in the field daily meetings will be held for discussions and explanations. The data secured in the summer field work will be made the basis of systematic work in platting, designing, etc., which will be carried on the following year. Different regions will be visited successive years in order that the students may become familiar with representative mines and methods of operation in different lines of mineral production.

DEGREES.

On satisfactorily completing the work of the curriculum of the College of Mining Engineering, the student is granted the degree of Engineer of Mines.

Owing to the number of strictly technical subjects the mining engineer must know, it is impossible, within the limits of a curriculum covering only four years, to give to the student an opportunity to take up many of those subjects which afford that broad, general culture which is so desirable. It is, therefore, strongly recommended that as many as can, take the work in the College of Liberal Arts as well as the work of the Mining Engineering curriculum.

As many of the courses in the curriculum of the College of Mining Engineering are accepted as required or elective courses in the College of Liberal Arts and Mechanical Engineering, a student may, by a careful selection of his studies, obtain in one or two additional years the degree of Bachelor of Arts or Mechanical Engineer in addition to that of Engineer of Mines. An honor student may find it possible to obtain the second degree in one additional year. No student, however, will be given the degree of Engineer of Mines and that of Bachelor of Arts or Mechanical Engineer who has not finished the work of at least one additional year and who has not satisfactorily completed the work leading to the respective degrees.

"HONOR" STUDENTS.

Students having a high grade of scholarship receive extra credit for excellence of work. Additional credits thus secured in the work of the mining engineering course will apply in the usual way in shortening the course in the College of Liberal Arts but will not serve to reduce the amount of work required in the College of Mining Engineering.

Recognizing the fact that a mining engineer may need a familiarity with a wider range of subjects than it is possible to include in the regular mining curriculum, the following alternative curriculum is offered, leading to a suitable degree.

Both the geological and the civil engineering sides of mining offer attractive fields of labor, one or the other of which certain students may desire to enter on account of natural aptitude or on account of circumstances. Accordingly the following courses of study have been arranged so that students wishing to emphasize the geological side will elect subjects marked (G), while those wishing to emphasize surveying and other civil engineering subjects will elect those marked (S).

First Year—

English I.
Chemistry I. General.
Mathematics I.
Descriptive Geometry (one half).
Mechanical Drawing (one-half).

Second Year—

Modern Language (G), or Calculus (two-thirds), and Surveying (one-third), (S).
Chemistry II. Analytical.
Geology I. General.
Physics I.
Field Work.

Third Year—

Modern Language II (G), or Modern Language I (S).
Geology II (one-half) (G), or Surveying II (S), (one-half).
Metallurgical Chemistry (G), or Metallurgical Chemistry or Physics II (S).
Mineralogy (two-thirds).
Economic Geology I (one-third).
Summer Field Work (Maps, Sections, etc.), (one-half).

Fourth Year—

Biology (G), or { Hydrography (one-third).
Sanitary Engineering (one-third).
Contracts and Specifications (one-third),
or Economics (one-third). } (S)

Assaying and Ore Treatment.
Mining Engineering (two-thirds).
Thesis (one-third).
Economic Geology II and Building Material (G), or Topography and Building Material (S), (one-third).
Elective (two-thirds).

(G). Students emphasizing geology are required to take two years of modern language. If this is taken in the preparatory work, two electives are allowed. One year of modern languages is required of students emphasizing surveying unless it is taken in the preparatory work.

(S). Calculus (two-thirds) and Surveying (one-third) are required of students emphasizing surveying, and a one-third course in surveying is required of students taking geological subjects.

SPECIAL STUDENTS.

Persons of maturity who do not wish to complete the courses leading to a degree, but who may wish to take up work for a short time in certain subjects offered in the curriculum of the College of Mining Engineering, may do so provided they show their ability to pursue with profit the work they select.

Very respectfully,
E. J. Babcock,
Dean College of Mining Engineering.

APPENDIX IV.

REPORT OF THE DEAN OF THE COLLEGE OF MECHANICAL AND ELECTRICAL ENGINEERING.

UNIVERSITY, N. D., October 15, 1904.

To the President of the University.

SIR:—I have the honor to submit, as dean of the College of Mechanical and Electrical Engineering, the following report of the college for the biennial period ending June 30th, 1904.

The college, established as one of the departments of the university in 1901, has had a steady and most satisfactory growth. During the past year instruction has been given to fifty-five students, classified as follows:

	Number of Students.
Mechanical Engineering	18
Mechanical Engineering (special)	1
Mining Engineering	6
Liberal Arts	7
Preparatory	15
Artisan	8
Total	55

The following curriculums are offered, Number I leading to the degree of Mechanical Engineer and Number II leading to the degree of Electrical Engineer:

	Curriculum I. Course Equivalent.	Curriculum II. Course Equivalent.
English	1	1
Chemistry	1 2-3	1 2-3
Physics	1 2-3	1 2-3
Mathematics	2	2
Mechanics	1	1
Experimental Engineering or Mechanical Laboratory Practice	1 5-6	1 5-6
Shop Work	2	2
Mechanical Drawing	1	1
Descriptive Geometry	1-2	1-2
Kinematics	1-2	1-2
Machine Design	1 1-3	5-6
Steam Engineering	1 1-2	1
Electrical Engineering	0	1
Total	16	16

The unit of work or "course equivalent" consists of four recitations per week for three terms. Three hours' work in the shops or draughting rooms or two and one-half hours' work in the laboratory counts as one recitation.

Instruction has been given, during the past year, in all courses leading to the degree of Mechanical Engineer; also, in Artisan courses in shop work, mechanical drawing and engine running. It has been thought advisable, owing to our limited equipment, to discontinue the artisan courses. Students taking English, chemistry, physics and mathematics recite with those of the College of Liberal Arts and the Normal College. The instruction in the other courses of the curriculum has been given in this college.

By an action of the general faculty during the past year, certain of the prescribed courses of the curriculums of this college have been made elective for students in the College of Liberal Arts, so that by a careful selection of his studies it may be possible for a strong student to obtain the degrees of Bachelor of Arts with that of Mechanical or Electrical Engineer in five years. This promises to become a popular and desirable combination, as students are already planning their work with the intention of taking both degrees.

The aim of the college is to give a strong course, making it a combination of the theoretical and the practical sides of the profession, but to do this it will be necessary to properly equip its various departments. The college has been provided with a building that will supply its needs in this respect for several years, but certain of its departments have been but partially equipped. A small outlay in shop equipment will enable the college to meet the probable demands for some time, but the mechanical laboratory has but a small part of the equipment it needs if a course comparable with those offered by the majority of other colleges of mechanical and electrical engineering is to be given. As intimated in my last annual report to the president, if this department is not equipped, students will find it to their advantage, at the end of their third year of attendance at this college, to go to another state to complete their course.

Respectfully submitted,

CALVIN H. CROUCH,

Dean of the College of Mechanical and Electrical Engineering.

EQUIPMENT.

The machinery and the special appliances required by the School of Mines are located in a number of well arranged rooms in the basement of Science Hall; the general chemical laboratories are located on the second floor of the same building.

As a part of the more distinctive mining equipment provided may be mentioned crushers, pulverizers; tube mills, clay working machines, small brick machines, compressed air or steam rock drills, testing machines, smelting furnaces and the various assay furnaces. Small cyanide and chlorination plants and electrolytic refiners will soon be in place. It is the aim to add appliances as rapidly as possible so that there may be built up a thoroughly equipped plant for all lines of experimentation and for the thorough and practical testing of building materials, fuels and minerals of all kinds.

It is possible for the mining engineering student to carry the ores of various metals through the actual metallurgical processes, though on a small scale. In the case of iron, coper or lead ores the refining can be carried far enough to secure sufficient quantity to be actually cast into the part of a machine. The student will thus carry the metal through every step in its transmutation from an ore to the finished part of a machine.

Special training will be given to fit men to develop the mineral industries of our own state. The coal and clay industries, which are destined rapidly to become large mineral wealth producers, will receive special attention. In connection with the great coal deposits of this state careful study will be made of the character of the coal, its geological deposition, the best methods of mining, handling, storing and burning. In work with the clays the student will first be made to determine the value and uses of the various clays by analysis, and then he will be made to work the clay into the various wares for which it is best adapted. For this purpose several small clay working machines have been secured and others will be added until the student can produce and burn in kilns a large number of clay wares, such as bricks, tiles, fire bricks, sewer pipes, jugs, jare and various dish forms.

The School of Mines has secured a very large and valuable collection of typical ores of the various metals, in large enough quantities for actual milling, concentration and smelting. Such collections are of great value to the students in their work of practical ore treatment.

REQUIREMENTS FOR ADMISSION.

Students are admitted to the College of Mining Engineering who have finished the work of the preparatory department, or who have from other schools credentials which may be accepted for preparatory subjects.

Graduates of high schools are admitted by certificate as in the College of Liberal Arts.

Though a foreign language is not required, it is strongly recommended as a part of the preparation for entrance.

Mature students who wish to take special work in mining engineering will be allowed to enter such classes as they are prepared for.

CURRICULUM.

The curriculum is arranged for students intending to become mining engineers, surveyors, metallurgists and manufacturing supervisors. It is the intention, therefore, while making prominent mathematics, physics, electricity, drawing and kindred subjects, to provide also extended work in analytical and metallurgical chemistry, assaying of ores, mineralogy, geology and surveying.

The following curriculum shows the required subjects leading to the degree of Engineer of Mines. Each subject extends throughout the year unless it is otherwise stated. As far as possible work elected along the line of mining engineering by students in the other colleges will be credited in lieu of other electives, subject to the approval of the faculty.

First Year—

English I.
Chemistry I, General.
Mathematics I.
Descriptive Geometry (one-half).
Mechanical Drawing (one-half).

Second Year—

Analytical Geometry and Cauculus (two-thirds).
Surveying (one-third).
Physics I.
Chemistry II, Analytical.
Geology I, General.
Summer Field Work.

Third Year—

Metallurgical Chemistry.
Mechanics (two-thirds).
Experimental Engineering (one-third).
Mineralogy (two-thirds).
Economic Geology (one-third).
Mechanical Drawing (one-half).
Summer Field Work, Maps, Sketches and Notes (one-half).

Fourth Year—

Assaying and Ore Treatment.
Physics II, embracing Applied Electricity, Power Transmission, Lighting, etc.
Mining Engineering (two-thirds).
Thesis (one-third).
Surveying or Machine Design (one-half).
An elective from the following:

Economics.
Contracts and Specifications.
Shop Work.
Mechanics of Engineering.
(One-third).

Students who have arranged their work with reference to the curriculum heretofore in force will be allowed to make such substitutions as may be necessary in fairness to them.

In special cases work in other lines may be accepted in lieu of certain of the above courses by permission of the faculty.

By referring to the work of the various departments of the university, it will be seen that several subjects are provided for in the regular courses of instruction. In connection with the study of chemistry, mineralogy and geology an opportunity is given for a large amount of special work upon minerals and metals.

Additions are constantly being made to the facilities for efficient and practical laboratory instruction in the various subjects connected with mining engineering. Special attention is given to ore testing, assaying and general technical and metallurgical chemistry.

DESCRIPTION OF COURSES OF STUDY.

The following outline is given of a few courses which have an especial technical bearing on the work of the College of Mining Engineering.

General Chemistry. During the first half of the year the work is in elementary chemistry; during the last half of the year qualitative analysis is taken up.

The student is introduced into the elements of the science by experiments, recitations and talks on general chemistry, accompanied by sufficient practical laboratory work to familiarize him thoroughly with the peculiar chemical action of the elements and their compounds, special attention being given to those of most common occurrence and general use. The work is about equivalent to that of Remsen's Introduction to the Study of Chemistry.

Qualitative Analysis. Most of the time is given to metal groups. By outlines and suggestive questions the student is led to work out a systematic means of grouping and identifying the metals. After this is done, a number of problems are given for determination. Most of the time is spent in the laboratory (eight periods a week). The class meets frequently for the discussions of methods and results.

Quantitative Analysis is begun with simple problems in the gravimetric and volumetric methods. As soon as the students become familiar with the methods and the use of the apparatus, he is given easy problems of a practical nature and of unknown composition. The student is thus led to see the application of his work to the affairs of daily life, and by the new view of the study of chemistry which comes to him, is given an inspiration for further investigation. At this point studies are assigned upon topics bearing upon the particular analytical work in hand. Reports are written, and from time to time the class meets to hear reports, discuss methods, and compare results. The work is nearly all in the laboratory and requires eight periods a week.

APPENDIX V.

REPORT OF THE DEAN OF THE COLLEGE OF LAW.

To the President of the University.

SIR:—On behalf of the law department of the University of North Dakota, I beg to submit the following biennial report:

The faculty of the law department as now constituted consists of Hon. Guy C. H. Corliss, Henry L. Birdzell, Bardi G. Skulason, Hon. Robert M. Carothers, F. B. Feetham, Harrison A. Bronson, Hon. Tracy R. Bangs, and Andrew A. Bruce. Of these Messrs. Bruce and Birdzell devote their whole time to the service of the school, the remaining gentlemen such time as can be spared from their respective law practices. The school now occupies rented quarters in the Clifford building at Grand Forks, which, although sufficient at first, have now become inadequate to its growing needs. During the year preceding the last biennial report there were registered in the law department twenty students; during the last school year fifty-one were registered. The present attendance is thirty-eight (the same as that of last year at the same date). The attendance during the year will probably be in the neighborhood of fifty. The graduating class of this year will number over twenty-five. Of the new students, at least one-half come from other law schools where they have already taken a partial course of one or two years, and are therefore admitted to the senior class of the school. This has a tendency to make the senior class relatively larger than the junior. The character of the work done in the school is, in the main, high; the students are, as a rule, of good character, earnest and industrious. This, it is submitted, is the chief criterion of the success and usefulness of any institution. The law course at present extends over two years of time. This period, on account of the relatively small size of the school and the opportunity for personal contact and acquaintance with the individual student (which is not afforded in larger institutions), is at present adequate, or rather it is believed that the average student acquires as much knowledge and training in two years here as he does in the large eastern institutions in three. As the school grows larger, however, a three years course will be necessary. There is no other department of the university the graduates of which are so soon put to the test of actual life, and who in active life assume greater responsibilities. There are no other graduates, therefore, in whose training, both moral and intellectual, more care should be taken. The school has been exceedingly fortunate in obtaining the friendly aid and co-operation of the members of the supreme court of the state, and perhaps the greatest step forward yet taken in the matter of legal education in the state of North Dakota has been the establishing of a common standard as between the graduates of the law department and other candidates for admission to the bar.. The law school, too, has been fortunate in securing the services of able attorneys to aid in its class-room work. It has during the past year, however, suffered an irreparable loss in the death of the late Justice John M. Cochrane, a lawyer who was not merely an able lecturer but one who thoroughly understood the law school and its needs and whose great heart went out in ready sympathy to all who strove for its advancement and to every student who entered its doors.

The great needs of the law school are more books and more money. The direct appropriation on the part of the legislature to it has in the past been nothing save fifty copies of such law books as the state may publish; the appropriation on the part of the university trustees, less than twelve hundred dollars yearly, if we deduct from the amount, $3,000, actually appropriated—the sum necessary to pay for the rent, lighting and care of the premises occupied by the school. No matter how patriotic we may be in relation to North Dakota, the fact still remains that even the best of North Dakota towns is not as attractive a place to the average student as is the average eastern city, nor are the expenses of living in the east nearly as great as they are here. If, therefore, North Dakota institutions desire to flourish, they must, in all things educational at least, offer the best.

Respectfully submitted,

ANDREW A. BRUCE.

APPENDIX VI.

REPORT OF THE SECRETARY OF THE BOARD OF TRUSTEES.

STATE UNIVERSITY, GRAND FORKS—1902-1903.

Balance on hand July 1, 1902	$ 23,174.72	
Received from warrants issued	40,000.00	
Received from State on mill tax	60,531.57	
Received from land interest	6,775.03	
Received from Geological Survey	327.67	
Received from rents, fees, etc.	15,203.02	
Received from boarding department	20,558.74	
Received from transfer from mill tax	3.364.99	
Expended on water mains		$ 650.00
Expended on Science Hall		1,089.00
Expended on President's house		18,198.00
Expended on Mechanic Arts Building		16,566.69
Expended on machinery		7,000.00
Expended on coal sheds and men's rooms		3,665.28
Expended on boiler and steam mains		7,993.00
Expended on tunnels		1,980.33
Expended on salaries		42,679.56
Expended on boarding department		20,452.36
Expended by departments and general maintenance		50,556.08
Balance in hands of Secretary		749.93
Overdraft on Treasurer	1,644.49	
	$171,580.23	$171,580.23

STATE UNIVERSITY, GRAND FORKS—1903-1904.

Balance on hand July 1, 1903	$ 749.93	
Received from State on mill tax	56,950.21	
Received from land interest	19,112.12	
Received from Geological Survey	1,000.00	
Received from insurance	3,929.31	
Received from State for flag pole	144.89	
Received from State for emergency app.	8,452.74	
Received from State for fire department	300.10	
Received from boarding department	21,728.22	
Transfers between departments	9,520.82	
Received from rents, fees, etc	18,835.63	
Overdraft on Treasurer July 1, 1903		$ 1,644.49
Expended on administration building		610.85
Expended on gymnasium building		187.00
Expended on President's house		7,367.95
Expended on heat, light and power		12,223.50
Expended on instruction		38,856.39
Expended on boarding department		21,323.93
Transfers between departments		9,520.82
Expended by departments and general maintenance		43,238.52
Balance on hand July 1, 1904		5,750.52
	$140,723.97	$140,723.97

Bonds and Warrants Outstanding—		
1901—4 per cent. bonds (Chap. 38, Session Laws 1901)		$ 50,000.00
Warrants outstanding, bearing 7 per cent. in'st.		76,000.00
Warrants outstanding, bearing 4 per cent. in'st.		16,000.00
Proceeds Expended on—		
Former indebtedness	$ 36,000.00	
Repairs	14,000.00	
Science Hall	36,000.00	
Mechanic Arts building	20,000.00	
Boilers, mains, and tunnels	20,000.00	
President's house	16,000.00	
	$142,000.00	$142,000.00

SALARY LIST—1904-1905.

Webster Merrifield	$ 3,000.00
H. B. Woodworth	600.00
John Macnie	2,000.00
E. J. Babcock	2,000.00
Joseph Kennedy	2,000.00
Geo. S. Thomas	2,000.00
M. A. Brannon	2,000.00
V. P. Squires	2,000.00
John Tingelstad	2,000.00
Calvin H. Crouch	2,000.00
Geo. S. Perrott	1,500.00
E. F. Chandler	1,750.00
James E. Boyle	1,000.00
O. G. Libby	1,750.00
Alice W. Cooley	1,000.00
G. W. Stewart	1,750.00
A. G. Leonard	1,500.00
W. M. Bryant	1,500.00
Marcia Bisbee	600.00
Johanna Kildahl	600.00
Arthur J. Becker	1,100.00
Mr. and Mrs. B. L. Main	1,200.00
G. J. Sweetland, Jr.	1,000.00
Gertrude Beers	495.00
Howard L. Schug	700.00
M. E. Donovan	900.00
Nellie Gillette	650.00
Gwendolyn Stewart	900.00
A. E. Morrison	1,600.00
George F. Strong	880.00
A. A. Bruce	2,250.00
C. H. Wallinger	1,200.00
J. M. Rysgaard	600.00
J. W. Wilkerson	900.00
Edith M. Bosard	495.00
Luther E. Birdzell	1,500.00
Edward J. O'Keefe, Engineer	1,080.00
Daniel Henry, Second Engineer	660.00
Janitors (4)	2,160.00
Teamsters (2)	1,080.00
Carpenter	720.00
	$54,620.00

Respectfully submitted,

A. E. Morrison,
Secretary.

APPENDIX VII.

PRELIMINARY REPORT OF THE STATE GEOLOGIST.

UNIVERSITY, N. Dak., Oct. 8, 1904.

Hon. George E. Towle, President Board of Trustees of the University of North Dakota.

DEAR SIR:—I have the honor to submit herewith the following report of the work of the state geological survey of North Dakota during the past two years. During the first half of this period the survey was under the direction of Dr. Frank A. Wilder.

During the past year the second edition of the Second Biennial Report, dealing with the lignite deposits of the state, was issued. The demand for the report was so great that the first edition of 1500 copies was exhausted within a few months and the legislature authorized a second of 2500 copies.

The frequent requests for the reports of the geological survey come not only from within the state but from individuals and companies all over the country. They indicate a widespread interest in the natural resources of North Dakota and it is an important function of the survey to furnish information concerning these resources. The answering of the numerous letters of inquiry which come to the office takes no small share of the time of the state geologist.

The policy of the survey in the future, as it has been in the past, will be to emphasize the economic problems presented for investigation and to do everything in its power to develop the natural resources of the state. This should in fact be the chief aim of any geological survey. In carrying out this purpose the survey has issued a report on the topography, geology and natural resources of North Dakota; a second dealing largely with the lignite coal fields of the region, and the forthcoming Third Biennial Report will contain the results of extended investigations as to the possibility of irrigating large tracts along the Missouri and its tributaries with pumping engines, using lignite as fuel.

The summer's work of the state geologist was directed in part toward becoming familiar with the different geological formations which occur within the state. For this purpose I visited a large number of widely separated localities where these formations appear at the surface, and the character of the rocks was carefully studied.

At the same time I began the investigation of the clays, which will form the subject of the report to follow the one now in press. These have already been studied by Professor Babcock and a large amount of valuable information secured, but much is left to be done before a full report on them is published. The many excellent clays which are found in all portions of the state were examined. Detailed sections were made showing the alternation and succession of the beds, with their thickness, and these will form the basis necessary for future study. Nearly all the clay plants were visited and much valuable information concerning them secured. The brickyards and coal mines in the vicinity of Williston, Minot, Burlington and Kenmare were visited. The Laramie beds, which are so rich in seams of lignite and valuable clay deposits, were carefully studied near Medora, Sentinel Butte, Dickinson, Coal Harbor, and many other points in the western part of the state. The high grade fire clays, pottery clays and brick clays occurring at Dickinson were found to have quite a wide distribution. They outcrop in the vicinity of Gladstone and extend east of there for a considerable distance, while they are found at least several miles to the north and south of Dickinson. It is hoped that next summer sufficient work can be done on these white, high grade clays to determine their distribution, thickness and stratigraphic relationships. Other clays of good quality were observed near Jamestown and Valley City, where the Pierre shales outcrop along the James and Sheyenne rivers.

The value and possibilities of our clays are strikingly shown in the North Dakota exhibit in the mines building at the St. Louis Worlds Fair, where a great variety of beautiful and artistic pottery is displayed, all manufactured experimentally in eastern factories from the clays found near Dickinson and elsewhere in the state.

Some time was spent in the Turtle Mountains region in the endeavor to find whether lignite occurs there. Coal has for years been mined near the eastern and northern edge of the mountains, in Canada, and also near Dunseith, in Rolette county. The drift deposits are so thick in this district that the underlying coal-bearing beds of the Laramie formation do not outcrop, but good sized fragments of the coal are found imbedded in the drift clays near Bottineau and elsewhere in the mountains, and furnish evidence that beds of coal are not far distant. It is very probable that seams of lignite will be found at no great depth below the surface, and the expense of putting down some prospect holes to determine their depth and extent would not be great, and would be warranted by the benefits secured if coal were discovered in this vicinity.

In connection with other lines of investigation, the building stones received some attention. Those near Velva, Sentinel Butte, Dickinson and elsewhere were examined and found to have the necessary durability and to be readily quarried. These sandstones form beds extensive enough to furnish an abundance of building stone of good quality. Three or four buildings in Velva have been constructed of the rock. At present about the only building stone throughout a large part of the state is supplied by the granite and other boulders of the drift, brought in from the north by the great glaciers which once covered this region.

A trip was made to the Pembina Mountains for the purpose of studying the rare and valuable cement rock and brick clays of that area.

The Third Biennial Report, which is now in the hands of the printer, contains reports on the following subjects:

(1) The Lignite on the Missouri, Heart and Cannon Ball Rivers and Its Relation to Irrigation.

(2) Report on the Region Between the Northern Pacific Railroad and Missouri River. Its Topography, Climate, Irrigation Possibilities and Coal Deposits.

(3) The Results of Stream Measurements in North Dakota During the Past Two Years.

(4) The Geological Formations of North Dakota.

It is believed that the volume contains much information of a very practical nature on the lignite deposits and irrigation problems and will serve to interest and educate the citizens of the state in the needs and possibilities of irrigation in the western portion. The maps accompanying the report show the location and thickness of the lignite seams outcropping along the chief streams, the location of the larger river flats, and other interesting features of the country.

The earliest investigations in the state on the possibility of using lignite for fuel in pumping the waters of the streams up onto the adjoining river flats were carried on by the state geological survey under the direction of Dr. F. A. Wilder. Work on this problem was begun in the summer of 1902 and continued during the next season by two parties that followed the Missouri and its tributaries. It is gratifying to be able to report that this line of investigation has now been taken up by the reclamation division of the United States Geological Survey. The federal survey now has two surveying parties at work along the Missouri, one in the vicinity of Bismarck, and another below Williston, studying the river flats and the possibility of irrigating them by pumping from the stream, using the lignite close by for fuel. If a favorable location can be found the government may establish an experimental pumping plant.

Through Professor Chandler the state geological survey is cooperating with the United States Geological Survey in measuring the flow of all the principal streams of North Dakota and the results of these measurements are given in the present volume. They will be found of much value in the investigation of the irrigation possibilities of the different drainage areas.

It is greatly to be hoped that the appropriation at the disposal of the survey during the next two years will be sufficient to make it possible to co-operate with the United States Geological Survey in the preparation of topographic maps of areas in the state. Such maps would be of the greatest service in the study of irrigation problems and a good topographic map is necessary before geological mapping can be undertaken. As soon as the required topographic sheets have been completed the survey will begin mapping the formations of economic importance in the western part of the state, in co-operation with the federal survey.

The survey has already made considerable progress in its investigation of the valuable clay deposits of the state and this work is being pushed to completion as rapidly as possible. The results will be embodied in the next report, which will contain a full discussion of the chemical and physical properties of clays, the manufacture of the various clay products, and the geological character and distribution of the North Dakota clays. The survey also plans to take up the study of building stone, cement rock and other subjects, and to continue the investigation of the lignite deposits, upon which there is still much to be done. Certain restricted areas, such as single counties, will be selected for careful study and detailed mapping, reports being prepared on the topography, geology and economic resources of the areas, including their water supply and irrigation problems.

The survey is building up a valuable library through the exchanges received in return for its reports. Many volumes of reports from the federal and state geological surveys are received and also the publications of American and foreign scientific societies. The best mining and geological journals are also received in exchange.

Respectfully submitted,

A. G. Leonard,
State Geologist.

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SEVENTH BIENNIAL REPORT

OF THE

PRESIDENT OF THE BOARD OF TRUSTEES

OF THE

University of North Dakota

UNIVERSITY OF ILLINOIS
PRESIDENT'S OFFICE

TO THE

GOVERNOR OF NORTH DAKOTA

Including the Reports of the President of the University, the Deans of the Several Departments, and the Director of the State Geological Survey, 1902

BISMARCK, N. D.
TRIBUNE, STATE PRINTERS AND BINDERS
1903

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LETTER OF TRANSMITTAL

UNIVERSITY, N. D., October 31, 1902.

Hon. Frank White, Governor of North Dakota:

Sir:—I have the honor to submit herewith the report of the Trustees of the University of North Dakota for the biennial period ending December 1, 1902. The condition of the scholastic work of the university has been very fully set forth in the accompanying report of the president of the University and the deans of the several departments. The financial condition of the university for the biennial period just closing is presented in the very complete report of the secretary of the board of trustees, which also accompanies this report. It remains for me to explain and to justify certain items in the secretary's report. I may preface this explanation with the statement that the last two years have been a period of transition for the university from a struggling college, somewhat meagerly, if never grudgingly, supported by a state itself heavily encumbered and with limited productive resources, to a true university, embracing many departments of learning and representing educationally a commonwealth of great potential resources, which, during the period under consideration, have experienced a development rarely exampled in the history of American commonwealths. North Dakota during the past two years has been in a position similar to that of Minnesota between the years 1882 and 1884—a period in which not only the general industries of the state but its state university especially experienced a greater aggregate development than during the two decades previous. Two years ago all the work of instruction and administration in the university was carried on in a single building. More than one high school in the state was better housed and far more adequately equipped for its work than was the state university. The work of the three science departments was carried on in crowded, dimly lighted and almost wholly unventilated quarters, most of them situated in a damp basement, and all of them ridiculously unfit for the purpose to which they were devoted. Hundreds of high schools east and west were far better equipped for doing modern scientific work. In view of the crying demand for more suitable quarters and a more ample equipment for the science work of the university, and in view of the facts that the university had recently been put upon a sound financial basis, as regards income, and that its magnificent grant of land was rapidly increasing in value, the trustees felt, not only that they were fully justified in anticipating the future ample income of the university in order to relieve a situation which had become intolerable, but that they would be false to a sacred trust were they weakly to fail to do so. The trustees were unanimous in the opinion that the splendid land grant of the university could never be more usefully and worthily utilized than by becoming the basis of a loan, the proceeds of which should be used for the erection of a suitable home for the science departments and of a suitable building for the recently established colleges of electrical and mechanical engineering. The reasons for establishing the latter departments have been very fully set forth in the president's report and need not be repeated here. Suffice it to say that these reasons seemed to the trustees too convincing to be disregarded. The current income of the university from the 2-5 mill tax was barely sufficient to meet the pressing needs for maintenance. Nothing remained for the trustees but to incur the expense of erecting two new buildings for the science and engineering departments respectively and to meet the expense by the issue of warrants fundable in bonds secured by the land grant of the university, when the authority of the legislature for such bonds should be obtained. The new buildings necessitated an increase in the capacity of the heating and lighting plant and a part of the proceeds from the sale of warrants was devoted to this purpose. During the past summer the president of the university was married and it became necessary to erect a president's house for the accommodation of his family. The great distance of the university from town and the presence of a dormitory system, thereby entailed, makes it necessary for the president to live at the university. The quarters in one of the dormitories which had served fairly well for an unmarried president were unsuitable for a man with a family. The president of an important institution of learning is always expected to entertain the invited guests of the institution and it is highly important that the president's house be the social center of the institutional life. No president would be willing to erect for himself an expensive house on the prairie two miles from town, which he might not be able to dispose of on severing his connection with the institution. Nothing remained, therefore, but for the trustees to erect a residence for the president on land belonging to the university. In so doing they have but followed the custom of almost every important college and university in the country. If such a building were to be erected it must, of course, be of such a character architecturally as would be in keeping with the increasing dignity of the university and at the same time must be sufficiently commodious to meet the needs of a president's residence for many years to come. The trustees have kept this twofold consideration in mind in the construction of the new president's house. As the president of the university has pointed out in his report, the great eastern universities are paying far more attention than formerly to architectural beauty in the construction of their buildings and far more than is generally paid by western universities. President Northrup of the university of Minnesota, on his return from the recent inauguration of Woodrow Wilson as president of Princeton University, addressed his students in chapel in part as follows: "While the work done in Minnesota compares very favorably with that of the older colleges of the east, there is a marked difference in the artistic surroundings. The eastern colleges seem to have an abundance of wealth and to know how to use it. Their buildings, chapels and class rooms are works of art and are much more pleasant than we have. Princeton is a notable example; her buildings are overgrown with ivy and the interiors are very attractive. Many of her alumni have attained great wealth and have come back to the college town, and spend their time trying to aid and beautify their alma mater."

The president pays a rental for the house sufficient to meet the interest on the money invested, so that the house adds nothing to his salary nor to the current expense of maintaining the university.

Following is a statement of the sums for which warrants have been issued by the board, with the rate of interest which these warrants draw. The proceeds from the sale of these warrants have all been used or will be used in making the improvements noted above:

For erection of science hall	$36,000.00
For erection of mechanic arts building	20,000.00
For equipment of mech. arts bldg., new boilers, tunnels, steam mains, new fuel room, etc.	20,000.00
For erection of president's house	16,000.00
Total	$92,000.00

—all drawing interest at 7 per cent except the issue of $16,000.00 for the erection of the president's house, which draws interest at 4 per cent. The legislature will be asked to authorize the issue of 4 per cent bonds in the sum of $92,000.00, for the purpose of funding these warrants. Such bonds, it is believed, can be sold at par. The income from the lands owned by the university and school of mines, will, in all probability, from the start be ample for meeting the interest on the proposed issue of bonds. If not, the deficiency should be paid out of the income of the university under the 2-5 mill act. The trustees, it will be observed, are not asking the state for a dollar of appropriation not already provided for. They are simply asking to be allowed to anticipate in a measure the future income from the land grant of the university for the purpose of making permanent improvements of which future generations of students will be the chief beneficiaries. To deny their request would be analogous to the action of a probate court in saddling upon an overburdened parent the expense of educating a minor child who is independently rich in his own right, but whose resources can not, without the court's consent, be used for such purpose. Before these bonds become due the income from the rental of the lands, together with the interest upon the proceeds of such of them as may have been sold, will constitute a sinking fund far more than sufficient to pay off the principal when due, besides taking care of the annually accruing interest on the bonds.

Confident that the members of the eighth legislative assembly, as well as your excellency, will approve of the course of the trustees in discharging what seemed to them a sacred duty, I have the honor to be,

Very respectfully yours,
DAVID BARTLETT.

REPORT

University, N. D., October 7, 1902.

Hon. David Bartlett, President Board of Trustees of the University of North Dakota:

Dear Sir:—I have the honor to submit to you herewith my report of the history and progress of the university during the past two years. Accompanying my report you will find reports from the various heads of departments setting forth the condition, at the present time, of the several departments which they have in charge.

ATTENDANCE.

The attendance during the last two years has shown a gratifying increase. The enrollment at the present time is more than a third larger than at a corresponding date last year. Last year's total attendance was in turn over 25 per cent larger than the attendance of the previous school year. A gratifying feature of the constantly increasing attendance is the constantly larger proportion of the total attendance in the upper classes. Our present senior class in all departments numbers fifty-one members and these presumably will graduate from the university at the commencement in June, 1903. The attendance for the school year 1901--2 was distributed as follows:

	Men.	Women.	Total.
Graduate department	9	2	11
College of arts...........	46	18	64
College of engineering	14	0	14
Normal college	16	117	133
Prep. dept.	69	16	85
School of Commerce......	24	16	40
Special	6	1	7
College of law...........	20	0	20
Total	202	170	374

Our attendance has always come, and is likely to continue to come, for some years, mainly from the north half of the state.

The young people living in the south half of the state either attend some one of the six state and denominational schools located in that section of the state or go to college in Minnesota. At present, the state institutions of higher education are not sufficiently differentiated, at least in the minds of students, for one institution to attract students from a remote section of the state past institutions of a somewhat different character but located nearer to the student's home. As the university comes to stand distinctively in the student's mind for one kind of training and the agricultural college distinctively for another kind, and as the state normal schools come to be regarded as schools exclusively for teachers, it is probable that young people seeking primarily an academic education will come to the university, and those seeking an agricultural education or a professional training for teachers will go to the agricultural college or one of the state normal schools, as the case may be.

It is believed that the engineering courses recently established and particularly the shorter courses in applied science will result in greatly popularizing the university and will bring to it a class of young men, particularly, who have hitherto been going to institutions outside the state.

NEW COLLEGES OF ENGINEERING.

Last year courses in mechanical, electrical and mining engineering were for the first time offered in the university. The colleges of engineering promise to become among the most popular and highly valued colleges of the university. During the past summer a mechanic arts building has been erected for the exclusive use of the colleges of engineering. This building has been amply equipped with blacksmith, carpenter, moulding and lathe shops, recitation and reading rooms, laboratories, etc., and affords facilities unsurpassed in the northwest for obtaining a technical education along the lines at mechanical, electrical and mining engineering. The students in the new courses are, without exception, enthusiastic over the nature of the work afforded them, and I anticipate that, in the near future, not only will a greatly increased number of students annually, enroll themselves as candidates for degrees in these courses but that many students who are candidates for the degree of bachelor of arts will take a part of their work each year in these courses. The charge was often brought against the so-called "old education" that it produced lopsided men along classical lines. Our modern schools of technology, it seems to me, are fairly open to the charge of producing lopsided men along technical lines. Our courses at the university have been so framed that students in the college of arts may take a part of their work in the engineering colleges and students in the engineering colleges may likewise take a part of their work in the college of arts. It is hoped that under this plan the university will turn out men more symmetrically educated than is done in most of our institutions of higher learning. The university of North Dakota is now in a position to offer as good courses in engineering and manual training as are offered in almost any school in the country, with the added advantage, for the present at least, that our rather small classes enable the student to receive far more individual instruction than is possible in similar institutions whose attendance is many times the size of our own. While colleges of engineering are among the most expensive departments of a university, the whole trend of modern educational thought is toward the incorporation of facilities for this sort of training in the curricula of modern universities, particularly of the modern state universities.

THE LAW SCHOOL.

The law school, opened in the fall of 1899 as a department of the state university, has amply justified its establishment. The school has already enrolled forty-eight students and it is probable that more than fifty members will be enrolled in the school during the present term. Hon. Guy C. H. Corliss still remains as Dean. Last year Samuel Peterson, Ph. D., D. C. L., a graduate of Yale university and the Yale law school, because a regular instructor in the school. At the opening of the present year Prof. Andrew A. Bruce, recently assistant Dean of the law school of the university of Wisconsin, began his duties as professor of law and secretary of the law faculty in our law department, The qualifications of Dean Corliss for his position are too well known to call for remark from me. Dr. Peterson and Prof. Bruce are admirably fitted by temperament, training and experience for the work of instruction in the law school. Hon. J. M. Cochrane has been a regular lecturer in the school ever since its establishment, and will continue as a regular lecturer while a member of the supreme bench. Several members of the Grand Forks bar have also given one or more lectures a week during the past three years. At the last session of the legislature a law was passed by which the diploma of the university admits its holder without further examination to practice at the bar of the state after the examination papers written by the candidate during his membership in the law school have been examined and approved by the members of the supreme court. The supreme court also recently prescribed as the requirement for admission to the bar of this state, the completion of a course of study equivalent to that offered in the law school of the state university.

The school has recently moved its quarters to the fine new office building at the corner of DeMers Ave. and Fourth St. Few schools in the country are better housed than the law school of the state university. While it has seemed wise for the present to retain the two years' course of study, it is believed that, with a continuous session of thirty-six weeks, and with lectures conducted six days in the week, the members of the school do practically as much work in the two years as is done by most schools which have a three years course.

SCHOOL OF PHARMACY.

At the last session of the legislature a bill was introduced providing for the establishment at the university of a school of pharmacy and a medical school. The bill was afterwards withdrawn by its introducer, as the corporate act of the university already provided for the establishment of such departments at the discretion of the board of trustees. In accordance with the intention of the board as announced in this bill, a school of pharmacy has been established at the university in connection with a pre-medical course which will, in the near future, be developed into a regular medical department or college of the university. This school received the cordial indorsement of the state pharmaceutical association at its last meeting, and promises soon to become one of the most useful departments of the institution.

SCHOOL OF COMMERCE.

A year ago a school of commerce was opened at the university with a four years' course of study corresponding closely to the course of study offered in the public commercial high schools which are being rapidly established in the leading eastern cities. While the purpose of the school is primarily to afford graduates of high schools an opportunity to supplement their high school training with a thorough business training special students are, for the present, admitted to the school after they have completed the common branches, and are allowed to take such studies in the school as they may choose to elect. The establishment of this school is in keeping with the trend of modern thought in educational matters. While the market is flooded with so-called stenographers who know little orthography and less grammar and rhetoric, the demand for stenographers and book-keepers with a substantial background of education, at least equal to that implied by a full high school course, greatly exceeds the supply. The school last year enrolled nearly sixty members and opens this year with an enrollment which promises to carry the total attendance considerably beyond the one hundred mark. It is the expectation of the university that this school will eventually develop into a separate college of commerce, comparable to the Wharton school of finance maintained at the university of Pennsylvania and to similar departments at the university of Wisconsin and other institutions of the first class. It is one of the gratifying features of the modern higher education that a steadily larger proportion of its students is going year by year into business and other non-professional vocations. The growing importance of Germany as a commercial and manufacturing nation is very largely attributed by the press of Great Britain and other countries which are becoming alarmed at Germany's increasing aggressiveness in commercial matters to the technical and commercial schools supported at public expense, for which Germany has long been preeminent in Europe. Commercial and manual training courses have for some time been popular electives in the high school curriculum in this state and it is believed that, before many years, every important high school in the state will have its departments of commerce, domestic science and manual training. There is a general awakening on the part of the people of this country as well as of the more progressive European countries to the fact that there is a direct relation between the commercial greatness of a nation and the general diffusion among its people of technical, and the so-called higher, education.

NEW BUILDINGS.

During the past two years the university has erected three new buildings. The new science hall, 54x100 feet in its main dimensions and four stories in height including a high basement, relieved a situation which had long been almost intolerable. From cramped, poorly arranged and poorly lighted quarters in the main building, the departments of biology, chemistry, and physics have moved into spacious, well lighted and admirably equipped quarters in the new science hall. The departments of biology, chemistry, mining, and physics each occupy an entire floor in the new building, and are provided with facilities rarely surpassed even in the great universities. An interesting feature of the new building is the fact that it is constructed almost entirely of North Dakota products, the raw materials for which were discovered and developed by the heads of our different scientific departments. During the past summer the university has erected a building for the colleges of engineering, 54x100 feet in dimensions and two stories in height. This building has been provided with forges, furnaces, lathes, saws, and all the adjuncts of a well equipped department of engineering in a modern university. No student in North Dakota has any longer an excuse for going outside the state for a general education, or even a special education, except in medicine and theology. During the past summer the university has also erected a president's house. The great distance of the university from town makes it incumbent on the president to live at the university. It also makes it highly desirable that the president's home be, to a degree unusual at institutions differently situated, a home for the student body and the social center of the university life. It was with the expectation that the president's home would serve in a large measure that double purpose here that the trustees decided to erect a president's house on the campus, which should be sufficiently comodious to afford entertainment for many years to come to invited guests of the university, and at the same time should be a model of architectural skill. Great educational institutions are building as much with reference to architectural beauty as to technical utility. Howevermuch the gospel of utilitarianism may be preached, even in high places, in North Dakota, there will always be a place in our educational system for the cultivation of the sense of the beautiful. It is as true today as it ever was that "life is more than meat, and the body than raiment."

NEEDS OF THE UNIVERSITY.

The buildings which have been erected during the past two years have relieved the most pressing needs of the university in the way of accommodations for the different departments. These needs were so imperative that the trustees were, in my opinion, fully justified in anticipating, as they have done, the action of the legislature in providing for these needs by the authorization of bonds to be issued against the university lands. The buildings erected during the past two years will, with proper care, serve the university for a hundred years to come. It is only fair, therefore, that the cost of these buildings should be charged against the permanent resources of the university. While a progressive institution of learning will always have urgent needs, there is perhaps no time in the history of such an institution when its needs are so urgent as in the early years, when, in the nature of things, the permanent plant of the institution has to be provided de novo. Anyone conversant with the great manufacturing enterprises knows how great is their first cost. Buildings must b erected and machinery installed which succeeding years must pay for. It is only ordinary business sagacity, at this stage, to make ample provision for the future of needs of the enterprise. Nothing in the long run is so expensive as makeshifts, and nothing is so purely indicative of a low order of business sagacity as to waste money in temporary makeshifts. The policy of the trustees in anticipating the future wants of the institution by a fairly liberal expenditure, rather than by a short sighted parsimony, is in keeping with the practice of our shrewdest business men and will certainly commend itself to the approval of our state legislators. The demand of the institution for more room was so imperative that it could not longer be deferred. The trustees would have been wholly unworthy of their sacred trust had they been deaf or indifferent to these urgent calls. Were the trustees to build at all, it was the highest economy to build for permanent use. They have incurred no expense which the state will be asked to pay for out of the general fund. They have incurred a floating indebtedness which the legislature will be asked to fund out of the ample resources of the university itself. As the result of the foresight of the trustees, the university is provided with a thoroughly up-to-date lighting, heat and power plant, which will be ample for many years to come and which can, with slight expense, be added to as occasion therefor may arise. The new science hall will be a suitable and adequate home for our science departments in all probability for the next decade at least. The same can be said of the new mechanic arts building.

A most pressing need of the university is for a combined assembly room, library and administration building. The seating capacity of our chapel is only about 35 per cent of the present attendance. Under the circumstances, attendance at chapel has, perforce, to be made voluntary. Perhaps nothing so marks a progressive institution of learning as a rapidly growing library. While our present library quarters answer fairly well for the housing of our present library, they will, in the natural course of the development of the university, soon be entirely inadequate. The present quarters of the president and secretary are entirely inadequate to the needs of those two important departments of administration and are, it is believed, more cramped than those of any other of our state institutions. The administrative work of the university is growing rapidly and more spacious quarters will soon have to be provided. Every inch of available room in the university is at present fully utilized and the only relief for the overcrowded condition of the assembly hall, library and the offices of administration will be through the erection of another building. It is not my purpose however, to recommend the erection of such a building within the next biennial period.

There is a crying need, also, for additional dormitory accommodations. The university greatly needs at present two new dormitories, one for the accomodation of young women and one for young men. Three young men are at present in many cases occupying rooms 11x24 feet, each, in dimensions. Such overcrowding is not only demoralizing to discipline and prejudicial to health, but presents a condition highly unsuitable for the best intellectual work. In an older settled community it would not be difficult to induce people of moderate means to build boarding houses about a growing institution of learning; but in a new community like ours, where capital commands large returns, it is impossible to interest it in an investment, which involves no little personal attention and annoyance. The problem of housing and feeding a large student body in such a community as ours, where comfortable room and board outside the dormitories, even in the rare instances where they can be obtained at all, command a price beyond the means of the average student, is one of the most serious difficulties to be overcome in building up a young university in a pioneer state. I am not, however, prepared at present to urge the board to undertake the erection of the two needed dormitories. It is perhaps a question whether the university should at this time commit itself finally to an extensive dormitory system, great as the advantages of such a system undoubtedly are, not only in the way of the cheapest practical provision for housing and boarding the student body, but also in the way of building up a more distinctive student community with its resulting esprit de corps and a more strongly marked social life than would otherwise be possible.

There is, however, one expenditure in the way of improvement which appears to me urgent. Both the main recitation building and Davis hall were erected in the early territorial days, at a time when building methods were far more primitive than at present. The basement timbers in both of these buildings were placed on, or in near proximity to, the ground, with no provision for ventilation. As a result these basement and foundation timbers have become badly decayed. The superstructure walls of these buildings, with a suitable foundation, will last for many years. In the main building particularly and only to a less degree in Davis hall the original flooring in all the rooms has become worn and splintered and is entirely unsuitable for present needs. The original plaster also, like all the plaster of those early days in North Dakota, was of the poorest quality and has now become so broken and unsightly that it ought to be completely renewed. I would recommend, therefore, the expenditure, within the next year, of fifteen to twenty thousand dollars in placing suitable foundation timbers under both the main building and Davis hall; in replacing the worn and splintered soft wood floors with hard wood floors, and in replacing both buildings from top to bottom with adamant or other hard plaster. North Dakota is not a poverty stricken state. Its state university should not, therefore, and need not, present an appearance which would not be creditable to the most primitive district school house on our prairies. With the improvements I have mentioned the university buildings will, throughout, present a creditable appearance and will be an object lesson on good housekeeping to our student body as well as a creditable exhibition of North Dakota's thrift and public spiritedness to the hundreds of visitors yearly from our own and other states.

Perhaps the most urgent need of all is for a university gymnasium. The small gymnasium which was maintained for some years in the attic of the cottage has been rendered unavailable by the recent occupancy of that building by young women students. At present there is no room in the university available for gymnasium purposes. I greatly doubt whether any other institution in the country of the size and resources of the university of North Dakota has such an entire lack of facilities for physical exercise as has the university. Without a gymnasium, it is practically impossible for an institution to accomplish anything in general athletics or to develop such physique and general physical well-being on the part of the student body as is fundamental, not only to future success in life, but also to ordinary physical health. In many of our universities, the gymnasium is the most expensive building connected with the institution. While I am not prepared to urge the expenditure of a considerable sum of money for a gymnasium here at present, I would most urgently recommend that, say, $3,000.00 be expended next summer in the erection of a plain frame or brick building of suitable dimensions and arrangement for the purpose of physical culture. Another crying need of the university, but one which it is believed can be filled in connection with the military department, is a physical director. The need of a new gymnasium under the charge of a competent physical director is so imperative that it cannot longer be disregarded. It is believed that a building costing not to exceed $3,000.00 could be erected which would serve the purpose of a gymnasium for ten years to come and would then be available for other university purposes.

THE INSTRUCTIONAL FORCE.

The instructional force of the university has been increased from time to time until now it numbers in all departments thirty-five regular instructors and lecturers. Mention has already been made of the new instructors in the department of law. Prof. Vernon P. Squires, who a year ago resigned the professorship of English literature here to accept a similar position in an eastern college, will return to the university at the beginning of the winter term. He is at present prosecuting his studies on leave of absence in Europe. Prof. John Tinglestad came to us at the opening of the present college year as professor of the German and Scandinavian languages and literatures.

To an ample preparation, Prof. Tingelstad adds long experience as a successful teacher and a wide circle of acquaintances, particularly among the Scandinavians of this state. Since the date of my last report, Prof. Calvin H. Crouch and Mr. Wm.

G. Smith, both graduates of Sibley college, Cornell university, have been added to our list of instructors in the departments of electrical and mechanical engineering. Dr. Orin G. Libby comes to us this year from the faculty of the university of Wisconsin as assistant professor of history. Dr. Frank A. Wilder, recently of the faculty of the university of Chicago, has accepted the combined position of assistant professor of geology in the university, and state geologist. Dr. Wilder was for some time assistant state geologist of Iowa and brings to his position here not only the best training of European and American universities, but a large practical experience in field and laboratory work. Mr. W. M. Bryant came to the university last year as principal of the newly established school of commerce and has already built up a strong department in his special line of work. Mrs. Alice W. Cooley, for many years supervisor of the primary work in the Minneapolis city schools, has been added to the instructional force of our normal department and brings to her work not only rare personal qualities and an unusually ripe experiece, but a national reputation. Misses Bisbee and Kildahl, graduates of the university, Mrs. May C. Peterson, a graduate student of Yale university, and Mr. E. P. Johnson, a graduate of Oberlin college, gave instruction last year in chemistry, biology, English and music and elocution, respectively, and remain with us in the same capacity this year.

THE WORK OF THE LITERARY, RELIGIOUS AND OTHER ORGANIZATIONS.

The students of the university have, for some years, maintained four excellent literary and debating societies. Two years ago a series of inter-society debates was successfully carried through, and last year a series of inter-collegiate debates was inaugurated. The university, through debating teams selected from the four societies, debated with teams representing the university of Manitoba and the university of South Dakota, winning the debate in each case. It is believed that these debating contests are among the most useful activities of the university. These inter-society and inter-collegiate debates, however, are only an episode in the active work maintained by the literary and debating societies throughout the year. In addition to the work of the debating societies, an excellent course of lectures was given last year by prominent speakers, mainly from within the state. The speakers in this course with their subjects were as follows:

Hon. H. C. Hansbrough, Public Life in Washington.
Hon. Chas. F. Amidon, The Development of Our National Life.
Pres. Joseph Carhart, The Ethics of Shakespeare.
Rev. Herman P. Fisher, Wendell Phillips, The Orator.

Prof. G. S. Perrott, The English Public Schools.
Rt. Rev. Cameron Mann, Character.
Rt. Rev. John Shanley, Mary Tudor.
Major John F. Fraine, The Philippines.
Major J. S. Murphy, Our Indian Policy.
Hon. M. N. Johnson, The Tariff.
Hon. George B. Winship, Old Times in North Dakota.
Hon. J. M. Devine, George Washington.
Rev. E. J. Conaty, Abraham Lincoln.
Prof. Gottfried Hult, Walt Whitman.
Hon. B. F. Spalding, Washington, The Capital (Illustrated).

The students also edit a monthly magazine, issue a University Annual and maintain a successful glee club and orchestra.

Branches of the National Association of Y. M. and Y. W. C. A. for colleges are maintained at the university and have done excellent work during the past year. In addition to the regular prayer meetings, the students have organized themselves into several classes for the study of the bible. Each Sunday evening a joint meeting of the Y. M. and Y. W. C. A. is held in the parlor and is addressed by some speaker selected from the faculty, or some clergyman, professional or business man from Grand Forks or from a distance An important part of the work of this association is the looking after the comfort and welfare of new students and the welfare of wayward students, The importance of this part of the work of our religious organizations cannot well be overestimated.

An active interest is taken by the students in all the usual forms of athletic sports. Active base ball, football and basket ball teams, and an active tennis association are maintained by the students under the general direction of the uiversity athletic associatio. These out-of-door sports, supplementing the regular and systematic military and calisthenic drill, are largely, I believe, responsible for the high average of good health which prevails among the student body.

The weekly receptions held in the parlor of Davis hall, with frequent special receptions given by one class or society to another, serve to promote a lively degree of interest in the social life of the institution. It is believed that there are few communities anywhere in which a richer intellectual, social and spritual life is maintained. These things, quite as much as the class room instruction, library, museum and laboratories, go to make up the sum total of the educational value of any important institution of learning.

HEALTH AND DISCIPLINE.

The health and discipline of the university since my last report have, in the main, been all that could be desired. With two exceptions, there has been no serious illness among the student body, and I venture to say that no community of equal numbers, in North Dakota or elsewhere, enjoys better health than does the student body of our state university. Regular hours, plain but wholesome food, and an intellectual and moral atmosphere afford conditions highly conducive to sound physical health. Our student body comes mainly from the farm, and most of our students are wholly or largely dependent upon their own efforts for their education. As might be expected, therefore, our community is marked by unusual earnestness and sobriety.

Respectfully submitted,
WEBSTER MERRIFIELD.

APPENDIX I

REPORT OF THE DEAN OF THE COLLEGE OF ARTS.

To the President of the University:

I have the honor to submit the following report as dean of the college of arts: The following list includes all the courses of instruction that were taken by undergraduate students during the year 1901--1902. Each course continues through the year, the class meeting five times a week.

BIOLOGY.

I. General Biology.
II. Histology and Bacteriology.

CHEMISTRY.

I. Elements of General Chemistry.
II. Qualitative and Quantitative Analytical Chemistry.
III. Sanitary and Technical Analytical Chemistry.

EDUCATION.

I. History of Education, Science of Education and Educational Problems.

ENGLISH.

I. Advanced Rhetoric. The Forms of Discourse, and Studies in Literary Form and Interpretation.
II. Shakespeare, Milton, Pope, Wordsworth and English Poetry since 1830.
III. History of American Literature and Study of English Prose.
IV. Old English, Middle English and History of the English Language.

FRENCH.

I. French Grammar and Reader. French Composition and Translation of Easy Authors.
II. Study of the Subjunctive Mood, Composition and Translation of More Difficult Authors.

GERMAN.

I. Grammar, German Composition and Translation of Easy Authors.
II. Composition—Schiller, Goethe and Lessing.

GREEK.

I. First Lessons, Composition and a part of Book 1 of Xenophon's Anabasis.
II. Lysias, Plato and Sophocles—Old Greek Life-History of Greek Literature.

HISTORY.

I. Civilization in the Middle Ages; English History; the Reformation as a European Event.
II. The French Revolution; Supplementary Revolutions in France; the Unification of Germany.

LATIN.

I. Latin Lessons, Composition and Translation of Easy Latin.
II. Selections from Viri Romae, Nepos and Caesar; Composition.
III. Cicero's Orations—Composition.
IV. Virgil's Aeneid—Composition.
V. Cicero De Senectute, Livy and Ovid—Composition.
VI. Horace's Odes, Satires and Epistles; Quintilian, Book X; Roman Antiquities; History of Roman Literature
VII. Juvenal, Pliny the Younger, and Tacitus.

MATHEMATIS.

1. Higher Algebra; Trigonometry; Analytical Geometry.
II. Analytical Geometry; Differential and Integral Calculus.

PHILOSOPHY.

I. Logic, Psychology and Psychological Problems.
II. Relations of Philosophy to the Sciences; History of Philosophy; Ethics.

PHYSICS.

I. Mechanics, Heat, Magnetism, Electricity, Sound and Light.
II. Light and Electricity.

POLITICAL AND SOCIAL SCIENCE

I. Some Applications of Political Economy; Public Finance; Banking.
II. Anthropology; Sociology; Socialism.

SCANDINAVIAN.

1. Norwegian Grammar and Reader; Bjornson's Synnove Solbakken; Composition.

SPANISH.

1. Spanish Grammar and Reader; Conversation and Composition.

The courses which are being given now are included in the following list:

BIOLOGY.

I. General Botany.
IV. Economic Botany.
V. Protoplasm, Cells and Tissues; Invertebrate and Vertebrate Zoology.

CHEMISTRY.

I. General Chemistry.
II. Qualitative and Quantitative Analysis.
III. Sanitary and Technical Analytical Chemistry.
IV. Pre-medical and Organic Chemistry.

EDUCATION

III. Practical Applications of the Philosophy of Teaching.
IV. History of Education; Science and Problems of Education; Philosophy of Education.

ENGLISH.

I. Advanced Rhetoric, the Forms of Discourse and Studies in Literary Form and Interpretation.
II. Shakespeare, Milton, Pope, Wordsworth and English Poetry since 1830.
III. History of American Literature and Study of English Prose.

FRENCH.

I. French Grammar and Reader; Composition and Translation of Easy Authors.
II. Study of Subjunctive Mood. Composition and Translation of More Difficult Authors.
III. French Prose and Poetry; Composition and Conversation.

GEOLOGY.

I. General and Economic Geology.

GERMAN.

I. German Grammar and Reader; Translation of Easy Authors, Composition and Conversation.
II. Schiller, Goethe and Lessing; Composition and Conversation.

GREEK.

I. First Lessons, Composition and part of Book 1 of Xenophon's Anabasis.

HISTORY.

I. History of Civilization in the Middle Ages; History of England.
IV. History of the United States.

LATIN.

I. Latin Lessons, Composition and Translation of Easy Authors.
II. Selections from Viri Romae, Nepos and Caesar; Composition.
III. Cicero's Orations; Composition.
IV. Virgil's Aeneid; Composition.
V. Cicero De Senactude, Livy and Ovid; Composition.

MATHEMATICS.

I. Higher Algebra, Trigonometry, Analytical Geometry.
II. Analytical Geometry; Differential and Integral Calculus.

PHILOSOPHY.

I. Logic, Psychology and Psychological Topics.

PHYSICS.

I. General Physics.
II. Heat, Magnetism, Electricity and Light.

POLITICAL AND SOCIAL SCIENCE

I. Elements of Economics; Industrial History; Advanced Economics.
IV. The State and Socialism; Social Problems; Municipal Problems.

SCANDINAVIAN.

I. Norwegian Grammar and Reader; Bjornson's Synnove Solbakken; Composition.
II. Lie, Ibsen and Runneberg; Composition.
IV. Old Norse.

SPANISH.

I. Spanish Grammar and Reader; Composition and Conversation.

II. Recent Spanish Plays and part of Don Guixote; Composition and Conversation.

The attendance in the college of arts has not, I regret to say, increased commensurately with the attendance in other departments of the university. The explanation is, perhaps, to be found herein that, since the establishment of other colleges in the university, many have entered there who, under former conditions, would have entered the college of arts. It is gratifying to me, however, to be able to report that the number of those entering the university from the high schools of the state without conditions is increasing. This shows that the high schools are moving forward and that more and more of them every year are becoming high schools of the first class. Of the students at present enrolled in this college less than 25 per cent are young ladies recognizing the fact that, though the training of the hand may not be essential to a liberal education, it has yet a distinct educational value and knowing that no high school in the state at present offers opportunity for such training, the faculty last year decided that students in the college of arts may elect one course of shop-work in the college of mechanical engineering and count it towards the degree of bachelor of arts.

The faculty also voted about a year ago that in lieu of four elective courses, that is, a year's work, a student may elect an equivalent amount of work from the courses of instruction offered in the college of law and have it credited towards the degree of bachelor of arts. This action of the faculty places it in the power of the student to shorten, by one year, the time required for the completion of the work of the two colleges, and thus tends, as we believe, to induce a larger number of students to take a college course—which no one will deny is desirable—before beginning their study of law. On the other hand, it does not, in the faculty's opinion, materially sacrifice the interests of the college of arts; for it cannot be denied that the study of the law in its broad, fundamental principles and its historical development is as liberalizing as any historical study nor that a kowledge of common and constitutional law is of great value to every citizen of our country, whatever his vocation in life may be. With what favor this privilege has been received by our students is shown by the fact that more than 20 per cent of our present senior class are taking work in the college of law.

GEO. S. THOMAS.

APPENDIX II

REPORT OF THE DEAN OF THE SCHOOL OF MINES.

To the President of the University:

GRAND FORKS, November 1, 1902.

The school of mines has been established as a department of a G shrdlu cmfwyp vbgkqj xzfiflffffi cmfwyp vbgk qjxzflffffficm the university as provided by the legislative act of March, 1890. In establishing this school the United States government provided for it by a grant of 40,000 acres of land. The wisdom of this act is manifest in two ways, namely, first, in providing a technical education in an industry which has become a close rival of that of agriculture and which is of immense importance in building up a commonwealth, and second, in setting aside land which has already become of great value and which will go far in endowing a mining department.

It is incumbent upon the commonwealths and upon the national government to unite in building up the most thoroughly equipped technical mining and metallurgical industrial schools. Congress now has under consideration several bills providing for the support of mining schools in a similar manner to the way it has done for agricultural schools, though to a much more limited degree. There seems to be a general feeling that such government aid will be wisely given and that one of these bills or one of similar character will soon be passed by the federal government.

That congress has not already provided such means for research and experimentation to aid our mineral industry as it has for agriculture is due in a large degree to the fact that it has only just begun to realize the gigantic proportions to which our mineral resources have grown and the untold wealth to be yielded up to us as, by new scientific discoveries and more skillful methods, we get more perfect mastery over nature. No industry requires for its success higher technical skill than does that of mining and metallurgy in the various phases, and next to agriculture no industry contributes so largely to the growth and prosperity of the nation. The growth and magnitude of our mineral productions is astonishing. It has now reached annually the enormous sum of over a billion and a quarter dollars, a large part of which, unlike agricultural products, is a permanent contribution to the nation's wealth.

North Dakota has not in the past been an extensive mineral producing state and for this reason people sometimes overlook the large mineral resources existing within our borders. The most important of these are th ecoals, clays and building stones. These mineral industries have just started on a period of rapid and large development. The value of their total production on the market within the state will probably reach $500,000 or $750,000 this year, and there is a large yearly per cent of increase. Such an industry is of immense value to the people of our state and deserves our most careful fostering and the services of the best trained mining specialists our school of mines can produce.

Young men thus trained in mining engineering will give a wonderful stimulus to the developmet of our various resources. Heretofore those seeking the services of such men were compelled to go outside our own state for them and then, perhaps, secure the proper men with great difficulty. And while this was being done by those interested in developing mines the young men of the state who wished to fit themselves as mining engineers were forced to go to distant states and at great expense to secure theeducation given in a school of mines.

There is therefore a very strong and a growing demand for a school of mines as a department of the state university of North Dakota. This need is made manifest by the inquiries which come concerning the work of this school of mines, as well as by the good-sized class formed at the start and by the number of others who are prospective candidates.

As will be seen by referring to the courses of instruction of the university school of mines and comparing these with courses offered by other mining schools, the school of mines of the university of North Dakota already has a strong and practical course. So good a start has been possible on account of the connection of this department with the university. Here every mining student has all the advantages of a university with its specialists in the various departments of instruction, with its library, its well equipped laboratories and its machine shops. The close affiliation between the mechanical engineering department and the school of mines is mutually very helpful as a considerable proportion of work is taken with the mechanical engineering students. All these helpful conditions rarely exist except in those cases where the school of mines is connected with the state university.

Considerable mining machinery and other equipment has already been secured, much of it through the generosity of many firms manufacturing mining machinery. Among the more important machinery now provided are crushers, pulverizers, tube mills, clay working machines, small brick machines, compressed air or steam rock drills, testing machines, smelting furnaces and the various assay furnaces. Small cyanide and chlorination plants and electrolytic refiners will soon be in place. Some other equipment and a number of other pieces of machinery are much needed and it is hoped will soon be secured.

It will be possible for the mining engineering student to carry the ores of various metals through the actual metallurgical processes, though on a small scale. In the case of iron, copper or lead ores the refining can be carried far enough to secure sufficient quantity to be actually cast into the part of a machine. The student will thus carry through every step from an ore to the finished part of a machine.

Special training will be given to fit men to develop the mineral industries of our own state. The coal and clay industries, which are destined rapidly to become large mineral wealth producers, will receive special attention. In connection with the great coal deposits of this state careful study will be made of the character of the coal, its geological deposition, the best methods of mining, handling, storing and burning. In work with the clays the student will be made to determine the value and uses of various clays, first by analyses, and then he will be made to work the clay into the various wares for which it is best adapted. For this purpose several small clay working machines have been secured and others will be added until the student can produce and burn in kilns a large number of clay wares, such as bricks, tiles, fire bricks, sewer pipes, jugs, jars and various dish forms.

During the past two summers the school of mines has secured a very large and valuable collection of typhoid ores of the various metals, some of which will be in large enough quantities for actual milling, concentrating and smelting. These collections will be of great value to the students in their work of practical ore treatment.

Arrangements are being perfected whereby students in mining will be taken to some of the great mines and smelters and mining regions. This will be done during the summer but will be a required part of their course. In this manner, by careful study under the direction of the professor in charge, they will become somewhat familiar with actual mining operations.

The desire is to provide laboratories, shops and furnace rooms with a variety of actual mining machinery, though of small size. This will require the addition of more supplies and machinery from time to time. With these provisions the ideal constantly maintained will be a strong technical and practical training which will fit young men to fill successfully important positions in the various branches of the mining industries.

Respectfully,
E. J. BABCOCK.

APPENDIX III

REPORT OF THE DIRECTOR OF THE COLLEGE OF MECHANICAL ENGINEERING.

UNIVERSITY, N. D., November 29, 1902.

To the President of the University:

Sir: There are enrolled in various subjects taught in the college of mechanical and electrical engineering students numbering as follows:

Mechanics of engineering	3
Kinematics	1
2nd year mechanical drawing or mechanical drawing (c)	10
1st year mechanical drawing or mechanical drawing (a)	17
2nd year shopwork or blacksmithing—shopwork (b)	12
1st year shopwork or woodworking	16
Machine repair	4

Instruction is also given to fifty-seven students of other departments in free-hand drawing, charcoal drawing, etc.

The equipment of the wood-working shop consists of twelve work benches provided with vises, saws, chisels and the various tools needed by carpenters and pattern makers. There are also four wood turning lathes provided with the necessary turning tools which get their power from a ten horse power electric motor. There is also a power grindstone.

The equipment of the machine shop consists of twelve bench vises, one metal planer, one speed lathe, one engine lathe, one universal milling machine, one upright drill and one wet emery tool grinder, together with the more important of the various small tools such as tops, dies, reamers, micrometers, drills, etc., needed to do ordinary machine shop work. This shop gets its power from a fifteen horse-power electric motor.

The blacksmith shop is provided with twelve down draft forges, twelve anvils and twelve sets of tools, such as tongs, etc. The forges are supplied with air by a blower and the forge gases are removed by means of an exhaust fan. The blower and fan are driven by a twenty-horse power electric motor which also furnishes power to the mechanical laboratory.

The foundry or moulding shop is provided with sand, patterns, flasks and necessary moulding tools. A cupola will be needed next year.

The mechanical laboratory is provided with only a portion of the equipment needed for work in this department. A testing machine for tensile and compressive strains up to 100,000 pounds has been installed; also, a centrifugal pump. There is also a steam and gas engine indicator, a planimeter, vacuum and pressure gauges, a portable platform scale, one twelve horse power steam engine and an ejector. A weir will be constructed for measuring the flow of water. Such equipment has been provided as will enable us to study strengths of materials and conduct duty tests of steam heating and power plants.

The motors in the various shops are sufficiently large to allow the addition of several machines in each shop.

Respectfully yours,
CALVIN H. CROUCH.

APPENDIX IV

REPORT OF THE DEAN OF THE NORMAL COLLEGE.

To the President of the University:

Dear Sir:—I herewith submit to you a report of the normal college, or department, of the state university for the biennial period ending December 31, 1902.

GENERAL FACTS.

The normal college, or department, was established as one of the integral and co-ordinate colleges of the university by the original charter granted by the territorial assembly in 1883 and confirmed by constitutional provision in 1889. Its purpose is to prepare young men and women for the teaching profession. The great work or calling of the teacher needs to be professionalized, just as the work of the lawyer is professionalized by the college of law, and the work of the doctor, by the college of medicine. A declaration of a bona fide intention to teach is necessary for admission to the normal college. The enrollment is about one-third of the total number in attendance at the university.

COURSES OF STUDY.

A course of study is a subject pursued for one whole school year. For the completion of the whole normal curriculum and to secure the normal diploma nineteen such courses are required. Four of them may be carried by the student each year, thus requiring five years for completion if the student enters at the beginning of the curriculum as he would at the beginning of a high school. The normal college curriculum is thus a broad and deep one, requiring for completion two years in addition to graduation from a first class high school. While our attendance could be greatly increased by cutting down our curriculum to the usual four years I believe it the best policy for the university to maintain this high standard. The individual courses are as follows:

1. Rhetoric and composition.
2. Algebra.
*3. Education (psychology, theory and practice.)

4. (a) Vocal music and elocution; (b) drawing.
5. General history.
6. Science (botany or physiography).
7. Geometry (pl. and sd.).
8. Elective (any course for which student is prepared.)
9. Literature.
10. A foreign language (Lat., Ger., Fr., etc.).
11. Physics.
*12. Education II (science of grammar, of arith., and philos. of U. S. hist.).
13. A foreign language (Lat., Ger., Fr., etc.).
14. Science (chemistry, botany, etc.)
15. English I. (advanced rhetoric, essays, rhetorical work, etc.).
*16. Philosophy I. (logic and psychology).
17. Elective (any course).
*18. Education III. (applications of educational philosophy, and round-table work).
*19. Education IV. (history and philosophy of education).

INSTUCTORS IN THE NORMAL COLLEGE.

In the work which is common to all the colleges (and much of it is of that character) the normal students recite with those in the college of liberal arts, in the college of mechanical and electrical engineering, and in the school of commerce. All the instructors are men and women who have had normal training or college training with a long and varied successful experience in teaching. Normal students thus get a broad outlook by being in the cosmopolitanizing influence of university life. In the professional courses, indicated above by stars, Mrs. Alce W. Cooley, for some years supervisor of primary work in the Minneapolis schools, is associated with me.

OTHER WORK.

In addition to the courses outlined above the normal students have rhetorical work and participate in the literary and debating societies at the university. The young men have military drill and the young women have physical culture. An excellent library course is offered thus enabling teachers to make the acquaintance of books and library methods. Courses of lectures are offered to teachers by departments other than that of education, as for example, the course given by Professor M. A. Brannon of the department of biology on public health, and that by Dr. Geo. S. Thomas of the department of Latin and Greek on The Method of Teaching Latin.

NO EXTRA COST.

The extra cost to the university and to the state, of a normal college is but little of anything. The courses in education which are given and required of normal students and constitute the differentia of the normal college, would and should, in any university of good standing, be offered as electives. A student in any of the other colleges may now take any of the courses in education as electives; but when a student declared it his intention to become a teacher and completes all the courses in education and also the other courses outlined above, he has finished the work of the normal college and is given, under the law, the normal diploma.

A WINTER SCHOOL FOR TEACHERS.

An excellent opportunity for reviewing English grammar, arithmetic, United States history, civics and physiology is offered during the winter term. These subjects are taught by a special teacher or by the regular instructors and professors in the university. This gives three months for a thorough review, which is much better than a summer school of only one month. It is, too, during a season of the year when most country schools are closed and when, therefore, teachers can conveniently attend. Only those who have taught or who intend to teach are admitted to these classes.

ADVANTAGES.

Normal graduates wishing to secure the B. A. degree, may generally do so in two additional years. It frequently happens that normal graduates, by the time they have completed the work of the normal college, or after teaching for a time, make up their mind to pursue their studies for a degree; this they can do without any loss in the way of credits.

TEACHERS AS SPECIAL STUDENTS.

Teachers desiring to improve in their work and feeling that it will be impossible to remain till graduation, may enter any of the courses for which they are prepared. A student may not, however, select a higher course of study before completing the work preparatory to it.

ITS USEFULNESS.

I am sure that the normal college, as is indicated by its constant growth, is supplying a need and a demand of the state and especially of the northern portion. It is certain that with the rapid growth of the state in population, the two normal schools, and the normal college at the university will not more than suffice to supply the needs of the teaching profession in North Dakota.

Very respectfully submitted,
JOSEPH KENNEDY,
Dean of the Normal College, The University of North Dakota.

APPENDIX V

REPORT OF THE DEAN OF THE COLLEGE OF LAW.

To the President of the University:

Sir: The college of law of the university of North Dakota was organized in September, 1899. The course of instruction outlined by the first faculty and since adhered to was designed to cover two full years of thirty-six weeks each. Lectures are, however, given on six days of the week instead of five as is customary in the majority of the law schools of the country. The growth of the school was at first slow, and, although the faculty has always been strong both in numbers and ability, the attendance on the part of students has in the past been but small and as yet only eighteen degrees have been conferred. With the present year, however, has come a marked change for the better. The law school indeed may now safely be said to have beeen put upon a firm and enduring foundation and to have entered upon an era of prosperity and influence. Not only has the college been moved into new and commodious quarters, and the faculty has been more closely organized, but the number of students in attendance has greatly increased. There are now forty-five students enrolled as against sixteen at the corresponding period of last year. Of these twenty-nine have entered the junior or first year class while six have left other law schools and entered the senior or second year class. The new students, it will be seen, number thirty-five in all at the present time.

The resources of the college of law are some $3,000, appropriated annually by the board of trustees of the university, a tuition fee of fifty dollars a year or seventeen dollars a term, exacted from each of the students and a graduation fee of five dollars. Fifty copies of each volume of the laws of the state and of the reports of the supreme court are also given by statute to the library of the college for exchange purposes. The personal property of the college is estimated to be of the value of some thirty-five hundred dollars, and consists chiefly of the books in the library, which, including the volumes of laws and reports received for exchange purposes and not disposed of, are about nine hundred and fifty in number.

The faculty of the college of law is exceptionally strong and will compare favorably with that of any other law school in the country. It is at present composed of the following gentlemen:

Webster Merrifield, M. A. President.

Hon. Guy C. H. Corliss, Dean and Professor of Torts, Conflict of Laws and Equity.

Andrew A. Bruce, B. A., L. L. B., Professor of Constitutional Law, Carriers, Agency, Damages and Common Law Pleading and Secretary of the Faculty.

Harrison A. Bronson, B. A., L. L. B., Lecturer on Municipal Corporations.

Hon. Robert M. Carothers, L. L. B., Lecturer on Wills and Administration.

Hon. John M. Cochrane, L. L. B., Lecturer on Criminal Law and Procedure and on Evidence.

F. B. Feetham, Lecturer on North Dakota Practice.

Bardi G. Skulason, B. A., Lecturer on Private Corporations.

Samuel Peterson, Ph. D., D. C. L., Assistant Professor of Contracts, Sales, Bills and Notes and Partnership

Special Lectures will also probably be given during the coming year by Hon. Chas. F. Amidon, B. A., Hon. N. C. Young, M. A., LL. B., Hon. D. E. Morgan, Hon. C. J. Fisk, Hon. C. A. Pollock, Hon. Tracy R. Bangs, Hon. W. S. Lauder and G. A. Bangs.

Respectfully submitted,

ANDREW A. BRUCE,

Secretary.

APPENDIX VI

REPORT OF THE STATE GEOLOGIST.

UNIVERSITY, N. D., November 1, 1902.

Hon. David Bartlett, President Board of Trustees of the University of North Dakota:

Dear Sir: I have the honor to submit herewith the second biennial report of the state geological survey of North Dakota. In taking up the work which the pressure of other duties compels Prof. Babcock to relinquish, I am very materially aided by the excellent introductory study made by him of the coals, clays and the waters of the state. The hearty appreciation of the purpose and previous work of the survey which I find everywhere through the state gives the greatest encouragement to those who are actively associated with the survey's affairs.

SCOPE OF THE SURVEY.

As definitely stated in the law under which the survey was organized, it is entrusted with the complete and thorough geological study of the state, and particularly with those lines of research that promise to develop its mineral wealth. Theoretical problems, however, are not to be neglected. The stratigraphic and topographic features of the state are to be studied and properly mapped, and the historical development of each is to be explained. A proper order for work is suggested in the statute or organization, in which primary stress is laid on the economic problems, to which the attention of the survey is specifically directed. It shall be my endeavor therefore, to direct the initial work of the survey so that the value of the natural resources of the state may be known, and at the same time as far as practical, to collect other data bearing on the theoretical problem that the state presents, which shall furnish material for later publications.

With the consent of the board of trustees the first bulletins of the survey will treat of the coals and clays, the water resources with special reference to irrigation, the building stones and cement material; probably in the order named. Preliminary reports as thorough as the time and means available allow will be made, and these will be followed by more minute studies in which the convenient unit of area will be the county. After the completion of the series of county reports material will be available for exhaustive topical papers.

In addition to what may fairly be termed the positive work of the survey, namely the pointing out of the mineral resources of the state which justify investment, a great deal of the survey work, just as important in its bearing on the development of the state, is negative in its nature, consisting in making examinations for interested citizens which result in assuring them that the proposition which they have submitted will not warrant development. In this way the survey saves to the state large sums of money and prevents many hopeless speculations which would delay the development of justifiable projects.

FINANCES OF THE SURVEY.

The finances of the survey are handled in accordance with the most conservative business methods. For local and office expenses no money goes through the hands of the state geologist or his assistants but all necessary expenditures are made through your secretary. In the field, vouchers are taken for all sums spent and these are filed with your secretary together with itemized statements, in correctness of which is sworn to before a notary. These statements and vouchers are subject to inspection at any time at the office of the secretary of the board of trustees.

CO-OPERATION WITH THE UNITED STATES SURVEY.

I take pleasure in reporting the friendly attitude of the United States Geological Survey, and the cordial co-operation which begun some years ago, is continued and extended during the present year. Some of the results obtained from this joint investigation are included in the accompanying report, though subsequent reports will profit more largely from these investigations which are this year only begun. By means of this co-operation the state geologist was this year able to enlarge the scope of his work, while during the next field season with an enlargement of the state appropriation to meet the liberal policy of the United States survey, the field and office work may be trebled in amount and increased materially in efficiency.

CONTENTS OF BULLETIN NUMBER TWO.

The present volume includes a preliminary report on the lignite coals of the state, prepared by the state geologist, assisted by Mr. L. H. Wood, A. M. Mr. Wood is a graduate of the university of Michigan and is engaged in advanced geological study at the university of Chicago. His report on the lignites of Ward county and the Ft. Berthold agency will be found painstaking and accurate and a valuable aid in the development of an important section of our state. .The large sums that are being invested in thoroughly equipped mines about Minot and Kenmare are fully justified and should bring good returns to the investors, and build up in this county a permanent industry of considerable magnitude. The desirability of developing industries like this in an agricultural community, I have reviewed at length in a separate chapter of this report, entitled, "The Significance of the Lignites to the State." Mr. Woods personally visited a large number of localities away from the railroad where coal is won for local use, by stripping, and secured samples from which analyses were made, the results of which are given in his report. In a prairie country where timber is lacking and distances to railroads often very considerable, the value of these lignite beds, scattered generally through the country, from which good fuel is obtained at a nominal cost, is very great, and they are proving one of the factors most favorable to a rapid opening up of this county. Mr. Woods' field expenses were very low, most of his traveling being by bicycle, and the state was fortunate in securing his services. For all of the sketches in this volume we are indebted to him. A more complete report on the geology of Ward county will be forthcoming in the proposed series, in which additional data will be published in regard to the coal of the county, as well as information, some of which is already in hand, in regard to its clays, water resources, building stones and gravels, and the interesting glacial problems that are associated with the valleys of the Mouse and Des Lacs rivers, and the Coteau du Missouri.

The portion of the present volume prepared by me, consists of a preliminary report on the lignites outside of the area studied by Mr. Wood. After visiting the larger mines of Ward county with Mr. Wood I went to Williston and studied the exposures of lignite and clay along the Missouri river, and on Stony, Muddy, and Sandy Creeks. Additional information in regard to coal farther north in Williams county, east along the Yellowstone, and south in Wallace county was obtained from the county surveyor, Mr. J. C. Field. Before the publication of the next report it is hoped that a representative of the survey may be able to visit hese localities and prepare extended descriptions. Returning to Minot, and going south on the "Soo" road, a day was spent about Velva, visiting a promising sandstone quarry one mile from town, and gathering data in regard to lignite. By wheel a trip of fifty miles was then made over the Coteau du Missouri, to Coal Harbor, with a stop at the coal mines ten miles southwest of Velva, along the Coteau. From Coal Harbor as a center, trips were made to the old mines about Ft. Stevenson from which coal for the agency and Indian school was taken for years, and to exposures along the Missouri river and neighboring creeks. Opportunities for irrigation along the Missouri were studied and material collected for joint reports to the state and the United States. From Coal Harbor to Washburn the trip was made by bicycle, and from Washburn trips were made to a number of mines and coal exposures. The large mine at Wilton was studied carefully, as a fair example of what can be done in the way of developing the lignites of the state. Through the courtesy of the mine owners and superintendent, ample opportunity was given to study the situation both above and below ground, and to look over the mine maps. In the minds of investor and mining engineer certain practical questions in regard to conditions for mining are uppermost, and in the chapter on the extent and availability of the lignite, many of these questions are answered. They have to do with the amount of water in the mines, the nature of the roof and floor, and the peculiar advantages and disadvantages that the lignites offer as a mining proposition. The mines at Sims, New Salem and Lehigh were also studied with these questions in mind, and many localities north and south of the railroad in the vicinity of these towns where coal is exposed, were visited. In connection with the special irrigation problem undertaken for the United States survey, two weeks were spent along the Heart and Green rivers, and two weeks along the Little Missouri, working north and south of Medora, sixty miles in each direction. The results of this work must be, in the main, reserved for a later volume, though much data with reference to the lignites collected on these trips, is submitted herewith.

Next to their abundance and availability, the worth of the lignites as a fuel is a subject worthy of careful investigation. This volume contains a report of the work done along this line up to date. Fortunately, the survey is greatly aided in getting at the facts, by the careful observations and experiments of a number of manufacturing and state institutions. The chapter devoted to this subject naturally divides itself into two heads; the laboratory tests; and the practical boiler tests, where lignite is burned under varying conditions, for the generation of steam and general heating. The results obtained are exceedingly satisfactory of these who are interested in the development of the lignite industry, and when published and properly circulated should stimulate the demand for lignite both in and out of the state.

The chapter on mineral statistics is to be a regular feature of the biennial bulletin of the state, and arrangements are being made so that in forthcoming reports data may be collected and tabulated with great accuracy, the state geologist co-operating with the department of mineral industry of the United States survey. This year the report on the output of coal and clay goods cannot claim to be complete, but it is believed that the output of products based directly on the natural mineral wealth of the state is under rather than over stated by the figures given.

Professor Babcock contributes to the report a practical paper on the surface waters, especially those of the Devil's Lake region, and makes suggestions in regard to the construction of wells that should be brought to the notice of great numbers [illegible] who are establishing new homes in the state.

The chemical work of the survey has been carried out by Prof. Babcock and Miss Bisbee. The amount has been considerable as the number of analyses given shows. The calorimetric tests of the lignite have been made by them also. All of this work is of the highest practical value, and the expense involved has been slight in comparison with the services rendered in presenting a report of the nature, a limited amount of technical knowledge of the subject on the part of the reader must be assumed. While it is desirable to present every subject as clearly and simple as possible, to enter into a detailed explanation of geological phenomena, which are well understood and are adequately described in the literature on the subject, is not practical. An attempt to treat the present report in this way would increase its bulk five fold. To those who desire a simple statement of the general geological phenomena of the state, I take pleasure in recommending Prof. Daniel E. Willard's book, "The Story of the Prairies," which may be obtained from the author at Mayville, North Dakota.

NUMBER AND DISTRIBUTION OF REPORTS.

I would recommend that the edition of the bulletin herewith submitted be fifteen hundred. A copy should be sent to each state official and to each newspaper, to certain of the county officers who are likely to be called on for the information that it contains, and to all public and school libraries in the state. A considerable number must be held to meet the requests of persons both in and out of the state, who desire information along the lines treated of in the report, and a number nearly as large must be sent to the various state and national geological surveys both of this country and Europe. In return for these volumes, the survey receives for the state an annual addition to its library numbering nearly fifty volumes, with technical papers and magazines of great value. It is further recommended, that of the fifteen hundred copies three hundred be bound as separate papers, to supply requests for information along single lines dealt with in the report.

PRESENTATION OF THE MINERAL INDUSTRIES AND WEALTH OF THE STATE IN TECHNICAL PAPERS.

A very pleasant part of the work of the state geologist has consisted in answering inquiries and preparing articles on the mineral wealth of the state for technical journals. During the past year the mining public has had its attention directed to the lignites of North Dakota by the success of the Washburn and other mines, and news from the lignite fields find a ready hearing. There is no danger at present of exaggerating the opportunities that the lignite offers as a mining proposition, and the great the publicity given the situation the greater the advance of the industry in the state.

REGULATIONS GOVERNING THE DISTRIBUTION OF INFORMATION GATHERED BY THE FIELD STAFF.

In connection with the distribution of data in regard to the mineral resources of the state, two fundamental principles can be laid down. First. Data gathered for the state and at the expense of the state is not to be given to any individual or company until it has been published and made available for all of the citizens of the state. Second. It is the duty and is an important part of the work of the state geologist to direct capital to the resources of the state that justify development.

In view of these principles a definite policy which the field staff of the survey should carefully regard, seems apparent; and I would herewith submit the following regulations touching this point, for your acceptance or revision.

No member of the field staff of the state geological survey shall make public information in regard to the undeveloped mineral resources of any locality or localities in the state, or in regard to sites suitable for irrigation, until a report on the same has been given to the public in a bulletin of the state or United States Geological Survey or in some other official state or naional publication.

When such data has thus been given to the public, it shall be the duty of the field staff of the geological survey to assist investigators who seriously propose developing the resources of the state, in any reasonable way that does not conflict with their other duties, provided, that no item of expense for such aid shall be borne by the state.

Aid which may be renederd investigators, under these regulations, will, it is believed, result wholly and fairly to the advantage of the state. For the field staff to refuse their aid altogether to outside parties seeking to gather information preliminary to investments, would result in preventing investment, or in bringing in specialists from eastern states whose knowledge of the local field must necessarily be limited, and their ability to present the resources of the state limited accordingly.

NEEDS OF THE STATE SURVEY.

Interest in the work of the survey on the part of the people in both city and rural communities is very manifest and genuine. At present its organization is ample, its relations with the United States survey most favorable, and the opportunity is offered for extensive and vigorous work. Most of the states of the union support geological surveys by appropriations that are from ten to fifty times as large as that enjoyed by the survey of North Dakota and many of them have mineral wealth which needs developing, greatly inferior to that possessed by our state. The survey has passed the preliminary stages in which it is well to be extremely conservative, and is ready with the proper support, to contribute largely to the building up of the material prosperity of the state.

ATTITUDE TOWARD THE AGRICULTURAL SURVEY.

At the last meeting of the legislature a subordinate survey was organized under the auspices of the agricultural college, to undertake field work which has a direct bearing on agriculture. It is the desire of the State Geological Survey to extend to the Agricultural Survey its aid and enable it as fully as possible to realize the aim of its organization, and proposals have been made with a view to determining how the state survey may best advance the interest of this allied line of research. The necessity of intimate relationship is realized by all the workers in the field, and the state geologist would suggest for the consideration of your honorable board, whether the Agricultural Survey should not be affiliated as a definite department of the state survey, which, primary in its organization, includes within its scope research along all of these lines.

Respectfully submitted,
FRANK A. WILDER,
State Geologist.

APPENDIX VII

REPORT OF THE SECRETARY OF THE BOARD OF TRUSTEES.

Summary of expenditures of the State University and School of Mines from July 1, 1900, to July 1, 1902.

JULY, 1900.

Instruction	$ 2,044.95	
Buildings	1,210.16	
Janitor	41.66	
Incidentals	322.72	
Secretary and registrar	66.66	
Law department	125.00	$ 3,811.15

AUGUST, 1900.

Instruction	$ 2,044.05	
Buildings	1,421.29	
Janitor	41.66	
Incidentals	41.59	
Secretary and registrar	66.66	
Law department	195.00	$ 3,811.15

SEPTEMBER, 1900.

Instruction	$ 2,044.95	
Museum	30.00	
Building and repairs	1,376.39	
Heat and light	110.49	
Janitor	41.66	
Incidentals	16.00	
Secretary and registrar	66.66	
Law department	125.00	$ 3,811.15

OCTOBER, 1900.

Instruction	$ 2,044.95	
Chemistry	84.51	
Physics	23.55	
Museum	30.00	
Library	45.07	
Repairs	846.45	
Incidentals	514.96	
Secretary and registrar	66.66	
Law department	155.00	$ 3,811.15

NOVEMBER, 1900.

Instruction	$ 2,044.95	
Chemistry	100.00	
Biology	80.81	
Physics	26.90	
Museum	30.00	
Library	35.00	
Buildings and repairs	82 92	
Heat and light	488.18	
Incidentals	730.73	
Secretary and registrar	66.66	
Law department	125.00	$ 3,811.15

DECEMBER, 1900.

Instruction	$ 2,094.95
Law department	230.00
Secretary and registrar	66.66
Incidentals	694.64
Library	164.87
Heat and light	370.93
Biology	499.78
Physics	99.88
Building	1,341.61
School of mines	687.04
Total	$ 6,250.36

JANUARY, 1901.

Instruction	$ 2,336.61
Museum	30.00
Law	162.75
Secretary and registrar	66.66
Library	58.75
Heat and light	427.97
Chemistry	2.60
Physics	55.53
Incidentals	287.60
Buildings	433.34
Total	$ 3,906.81

FEBRUARY, 1901.

Instruction	$ 2,253.28
Museum	30.00
Registrar and secretary	66.66
Law department	440.00
Biology	24.74
Physics	126.00
Library	307.79
Heat and light	471.44
Repairs	89.90
Incidentals	45.38
Building	51.62
Total	$ 3,906.81

MARCH, 1901.

Instruction	$ 2,253.28
Museum	30.00
Registrar and secretary	66.66
Law department	220.00
Library	80.40
Heat and light	220.42
Incidentals	148.63
Building	887.42
Total	$ 3,906.81

APRIL, 1901.

Instruction	$ 2,178.28
Museum	32.00
Registrar and secretary	66.66
Law department	215.00
Library	38.83
Heat and light	33.10
Biology	8.65
Incidentals	110.90
Repairs	76.85
Building	1,146.54
Total	$ 3,906.81

MAY, 1901.

Instruction	$ 2,178.28
Museum	30.00
Registrar and secretary	66.66
Law	279.83
Library	140.02
Heat and light	67.52
Biology	56.25
Incidentals	107.00
Military	13.25
Normal department	1.25
Building	966.75
Total	$ 3906.81

JUNE, 1901.

Instruction	$ 2,089.95
Registrar and secretary	66.66
Chemistry	4.80
Museum	14.45
Library	39.58
Heat and light	25.26
Repairs	55.40
Incidentals	506.95
Law department	302.50
Building	801.26
Total	$ 3,906.81

CLASSIFICATION OF EXPENDITURES—FISCAL YEAR, 1900-1901.

Instruction	$ 25,609.38
Museum	256.45
Law department	2,575.08
Secretary and registrar	799.92
Incidentals	3,527.10
Building	9,719.30
Janitors	124.98
Library	910.31
Heat and light	2,260.31
Chemistry	191.91
Physics	331.86
Biology	670.23
School of mines	687.04
Repairs	1,068.60
Military	13.25
Normal department	1.25
Total	$ 48,746.97

JULY, 1901.

Instruction	$ 1,836.62
Law department	160.00
Registrar and secretary	83.33
Heat and light	21.30
Repairs	20.05
Incidentals	362.20
Building	1,423.31
Total	$ 3,906.81

AUGUST, 1901.

Instruction	$ 1,711.62
Registrar and secretary	83.33
Law department	125.00
Chemistry	223.34
Library	24.08
Heat and light	207.61
Incidentals	368.30
Buildings	1,073.93
Physics	89.60
Total	$ 3,906.81

SEPTEMBER, 1901.

Instruction	$ 2,371.62
Law departmeint	309.30
Registrar and secretary	83.33
Physics	49.84
Repairs	175.73
Incidentals	77.55
Building	839.44
Total	$ 3,906.81

OCTOBER, 1901.

Instruction	$ 2,564.95
Registrar and secretary	83.33
Law department	205.00
Physics	26.12
Library	14.80
Heat and light	200.35
Repairs	45.33
Incidentals	741.13
Building	25.80
Total	$ 3,906.81

NOVEMBER, 1901.

Instruction	$ 2,504.95
Registrar and secretary	83.33
Chemistry	54.61
Biology	94.61
Physics	172.90
Museum	3.40
Library	113.19
Heat and light	4.30
Repairs	18.98
Incidentals	391.28
Law department	352.97
Building	112.38
Total	$ 3,906.81

DECEMBER, 1901.

Instruction	$ 2,757.65
Registrar and secretary	83.33
Law department	2.30
Museum	54.70
Library	59.62
Heat and Light	360.84
Repairs	36.23
Incidentals	267.22
Building	284.99
Total	$ 3,906.88

JANUARY, 1902.

Institution	$ 2,688.28
Secretary and registrar	83.33
Law department	185.00
Museum	50.00
Chemistry	12.39
Biology	16.00
Physics	126.60
Library	281.78
Incidentals	204.69
Heat and light	325.51
Building	179.75
Total	$ 4,153.33

FEBRUARY, 1902.

Instruction	$ 2,688.28
Secretary and registrar	83.33
Law department	520.00
Museum	50.00
Library	66.50
Incidentals	736.66
Heat and light	8.50
Building	.06
Total	$ 4,153.33

MARCH, 1902.

Instruction	$ 2,688.28
Law department	220.40
Secretary and registrar	83.33
Museum	50.00
Heat and light	703.96
Physics	69.62
Library	47.98
Incidentals	10.25
Biology	4.53
Chemistry	9.05
Repairs	164.55
Building	101.38
Total	$ 4,153.33

APRIL, 1902.

Instruction	$ 2,554.95
Law department	572.50
Secretary and registrar	83.33
Chemistry	10.41
Physics	6.01
Biology	4.40
Museum	120.00
Library	35.24
Heat and light	32.18
Incidentals	155.00
Mechanical engineering	99.04
Building	480.27
Total	$ 4,153.33

MAY, 1902.

Instruction	$ 2,604.95
Registrar and secretary	83.33
Law department	366.63
Physics	49.75
Library	14.20
Heat and light	2.07
Repairs	56.66
Incidentals	302.52
Normal	18.37
Building	654.85
Total	$ 4,153.33

JUNE, 1902.

Instruction	$ 2,495.45
Biology	4.50
Library	46.78
Heat and light	41.40
Incidentals	58.75
Secretary and registrar	83.33
Law department	433.75
Normal	1.16
Building	991.21
Total	$ 4,153.33

CLASSIFICATION OF EXPENDITURES—FISCAL YEAR, 1901–1902.

Instructions	$ 29,464.60
Registrar and secretary	999.96
Law department	3,452.85
Chemistry	309.80
Building	6,167.37
Incidentals	3,675.55
Repairs	517.44
Heat and light	1,908.02
Physics	590.44
Library	704.17
Biology	124.04
Mechanical engineering	99.04
Museum	328.10
Normal department	19.53
Total	$ 48,360.91

PAY ROLL OF THE STATE UNIVERSITY AND SCHOOL OF MINES.

	Per Year
Webster Merrifield, M. A., president, professor of political and social science	$ 3,000.00
Horace B. Woodworth, B. A., Professor of history	1,200.00
John Macnie, M. A., Professor of the French and Spanish languages and literatures, and secretary of the faculty	2,000.00
Earle J. Babcock, B. S., professor of chemistry and mineral-	

ogy, and dean of the college of mining engineering	$ 2,000.00
Joseph Kennedy, M. A., professor of philosophy and education, and dean of the normal college	2,000.00
George S. Thomas, M. A., Ph. D., professor of the Greek and Latin languages and literatures and dean of the college of arts	2,000.00
Melvin A. Brannon, M. A., professor of biology and curator of the museum	2,000.00
Vernon P. Squires, M. A., professor of the English language and literature	2,000.00
John Tingelstad, M. A., professor of the Scandinavian and German languages and literatures	1,500.00
George St. John Perrott, B. A., assistant professor of Latin and Greek	1,500.00
Carl J. Rollefson, B. A., assistant professor of physics	1,750.00
Andrew A. Bruce, M. A., LL. B., professor of property, evidence, trusts, corporations, partnership, and bankruptcy and secretary of the faculty	2,000.00
Elwyn F. Chandler, M. A., assistant professor of mathematics	1,200.00
Calvin H. Crouch, M. E., assistant professor of mechanical engineering and director of the college of mechanical and electrical engineering	1,600.00
Samuel Peterson, Ph. D., D. C. L., assistant professor of political and social science	1,200.00
Orin G. Libby, Ph. D., assistant professor of history	1,000.00
Frank A. Wilder, M. A., Ph. D., assistant professor of geology and state geologist	1,650.00
W. M. Bryant, M. Acct., principal of the school of commerce	1,000.00
Marcia Bisbee, M. A., instructor in chemistry	500.00
Johanna Kildahl, M. A., instructor in biology and assistant curator of the museum	500.00
Alice W. Cooley, instructor in education	1,000.00
Everett P. Johnson, B. A., instructor in music and elocution	920.43
May C. Peterson, B. A., instructor in English	650.00
Mertie Davis, instructor in shorthand and typewriting	600.00
William G. Smith, M. E., instructor in mechanical engineering	900.00
Andrew E. Morrison, B. A., register and secretary	1,200.00
Marion E. Twiss, B. A., librarian	750.00
Annie B. Long, preceptress	1,000.00

The following members of the Law Faculty are paid at the rate of two dollars and a half per lecture, except Dean Corliss, who is paid five dollars per lecture:

HON. GUY C. H. CORLISS,
Dean and Professor of Torts and Conflict of Laws.

SAMUEL PETERSON, PH. D., D. C. L.,
Instructor in Property, Criminal Law, Contracts, Bills and Notes, Damages and Suretyship.

H. A. BRONSON, M. A., LL. B.,
Lecturer on Municipal Corporations.

HON. JOHN M. COCHRANE, LL. B.,
Lecturer on Criminal Procedure.

BARDI G. SKULASON, B. A.
Lecturer on Sales and Carriers.

HON. TRACY R. BANGS,
Lecturer on Witnesses.

HON. ROBERT M. CAROTHERS, LL. B.,
Lecturer on Wills.

F. B. FEETHAM,
Lecturer on North Dakota Practice.

G. A. BANGS,
Lecturer on Commercial Instruments.

SPECIAL LECTURERS

HON CHARLES F. AMIDON, B. A.,
Lecturer on Equity.

HON. N. C. YOUNG, M. A., LL. B.,
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HON. D. E. MORGAN,
Lecturer on Extraordinary Legal Remedies.

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	*Per Month.
James M. Hamm, engineer	$ 61.00
Edward J. O'Keefe, engineer	51.00
Olaf Sundby, fireman	41.00
William Bolduck, fireman	41.00
Herbert Allen, janitor	41.00
Patrick Sheill, janitor	41.00
Peter Graven, carpenter	51.00
Henry Hemsing, teamster	46.00
Henry Johnson, teamster	41.00

* Board not included.

ESTIMATES.

Estimate of value of apparatus in—

Physical department	$ 5,000.00
Chemical department	4,500.00
Biological department	4,300.00
Mechanical engineering department	10,000.00
Total	$23,800.00

REPORT OF LOANS.

Erection of Science Hall	7 per cent.	$ 36,000.00
Erection of Mechanic Arts Building	7 per cent.	20,000.00
Erection of Coal Shed, Equipment of Mechanic Arts Building, New Boilers, Tunnels, Steam Mains, etc.	7 per cent.	20,000.00
Erection of President's House	4 per cent.	16,000.00
Total		$ 92,000.00

This loan draws interest as shown above, payable on the 15th of March and September, and at the maturity of the principal.

A.E. MORRISON,
Secretary.

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NINTH BIENNIAL REPORT OF THE PRESIDENT OF THE BOARD OF TRUSTEES

OF THE

University of North Dakota

TO THE

GOVERNOR of NORTH DAKOTA

Including the Reports of the President and the Deans of the
several Departments, and the Report of the Secretary
of the Board of Trustees of the University, together with the Report of the Director
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BISMARCK N. D.
1907

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CORNELIA B. WHITE,
Assistant Housekeeper.

EDITH M. BOSARD,
Secretary to the President.

LETTER OF TRANSMITTAL.

Nov. 1, 1906.

Hon. E. Y. Sarles, Governor of North Dakota.

Sir: I have the honor, as President of the Board of Trustees of the State University and School of Mines of North Dakota, to submit my report for the biennial period, June 30th, 1904 to June 30th, 1906. In doing so I take pleasure in transmitting the report to myself of the President of the University, the reports to him of the deans of the several colleges and the financial report of the University submitted by the secretary of the Board of Trustees.

The decision of the Supreme Court, declaring unconstitutional the law authorizing the several institutions to bond their lands for the purpose of providing greatly needed buildings, left the University with a floating indebtedness of $92,000 unprovided for. The legislature at its last session appropriated $68,000 to apply on this indebtedness. The Trustees applied $8000 from the current income during the biennial period toward the reduction of this debt, leaving $16,000 of the indebtedness still unpaid. The secretary's report shows a balance on hand June 30, 1906, of $16,367.29. This will take care of the remaining $16,000 of floating indebtedness and leave a balance for the year of $367.29. The Trustees believe that no public institution in the state or in the country has been conducted during the past two years with a greater regard to efficiency and economy. Every expenditure has been most carefully scrutinized and no money has been expended for any purpose for which there did not seem the clearest warrant. Indeed, many legitimate and pressing demands of the University have been denied because of the lack of funds, particularly in the way of greatly needed repairs to buildings, which it would have been the highest economy to make had funds been available. These repairs, however, were deferred as being the one claim which could be most easily denied. The University during the past two years has had an unprecedented growth, as the President has pointed out. The attendance during the past year has been in the neighborhood of 750 students and, if the recent rate of growth shall be maintained, the institution will have fully 1,200 students before the meeting of the legislature of 1909. While such growth calls for large expenditures it has been and will be but indicative of the growth of the state in population and in resources and it will impose no greater burden upon the state to meet the demands which this growth has entailed than has been imposed in the past. North Dakota is not a poor state. There are few, if any, states in the Union which can boast a higher per capita of wealth. The educational system of North Dakota is the chief pride of the state and ranks inferior to that of no other commonwealth, as the President of the University points out in his report. While North Dakota is liberally supplied with institutions of higher learning, she is able to make reasonable provision for all of them. She should not, however, forget that the leading institution is the University. This, as its name implies, is the one school which affords an opportunity to obtain an education along practically every line, to train its students for every calling in life. The other institutions are in the nature of special schools and train their students for work along special lines. It goes without saying, therefore, that the needs of the University are as much greater as its field of work is more comprehensive and its training more varied. The needs of the University for the ensuing biennial period, when reduced to their lowest possible expression, call for an appropriation of at least $150,000 from the legislature soon to convene. The maintenance of the University is provided for by the mill tax, of the income from which the University receives two-fifths. This, however, does not provide for new buildings, and the University is in pressing need at the present time of three new buildings, viz.: (1) a building which will serve for the present the three-fold purpose of an auditorium, an armory and a gymnasium; (2) a women's dormitory; and (3) a building for the State School of Mines.

The law in this state requires physical culture and calisthenics to be taught in every public school and all of the state educational institutions. Having prescribed instruction in this subject, the state must make provision for carrying out its requirement. At present the University has no gymnasium. It is the only state educational institution which is entirely without provision for this work. Several of the younger and smaller institutions have separate gymnasium buildings. The University does not ask similar provision for itself at present. The law requires the University to offer instruction in military science; but, in the absence of a suitable armory, the University has found it necessary to suspend work in military drill for the last three years. The University, furthermore, is the only educational institution belonging to the state which is wholly unprovided with an auditorium. When for any purpose it is desirable or necessary to call the student body together, it has to be done in a low basement unprovided with seats. When Mr. W. J. Bryan visited the University two years ago to address the students he said to them on leaving the small hall in which his address was given: "Young people, North Dakota ought to provide its State University with a better assembly hall than you have here. If I lived in North Dakota and had sufficient influence, you should have an adequate assembly hall." Even the hall in which Mr. Bryan spoke, inadequate as it was, has been converted into offices of administration for the president, secretary and registrar. The old secretary and registrar's office was a mere cupboard and had become utterly inadequate. It was, moreover, not provided with a vault and there was no provision for storing the records of the University where they would be safe from destruction by fire. When the Main Building was renovated during the past summer the offices of administration were transferred to what had been the old assembly hall or chapel, and the institution for the first time is provided with a vault adequate to present needs at least. Distinguished speakers frequently visit the University and it is no uncommon sight for six to eight hundred students, both young men and young women, to stand for an hour in a poorly ventilated and poorly lighted basement while listening to the address of visiting speakers. North Dakota certainly is not so poor as to make this hardship on the part of the young people of her State University necessary.

Further, as the president points out, military drill has been suspended at the University for three years owing to a lack of a suitable hall in which to carry on the work, although the department of military science is prescribed, in the act creating the University, as a department co-ordinate with the College of Liberal Arts, Law, Engineering, Medicine and Education.

Another urgent need is an additional dormitory for the young women. The President of the University reports that during the past year every room in the young ladies' dormitories was filled, and that most of the rooms had four occupants during a large part of the year. Such crowding is not only highly prejudicial to health but is highly detrimental to good order and the best scholastic work. Even with such crowding, many of the young women were turned away from the dormitories and had to find living places in the city of Grand Forks. Quite apart from the menace to morals involved in sending young girls from the farm to find homes for themselves in a city of the size of Grand Forks is the further important consideration that such homes as they do find in an overgrown city are oftentimes comfortless and cheerless as well as expensive and, in the nature of things, necessitate a degree of isolation and a lack of elevating social intercourse which deprive young women students of the highest good to be derived from attendance upon an institution of learning. The taxpayers of North Dakota are even more anxious that their daughters in attending the State University should be surrounded by refining influences and an agreeable home life, such as are to be found in the young women's dormitories, than that they should be well taught in the class rooms of the institution. Even those state universities which have deemed it inexpedient to adopt the dormitory system for their male students, have, almost without exception, erected dormitories for their young women students. Some of the costliest buildings erected in recent years at such typical universities as those of Illinois, Wisconsin and Missouri have been for the accommodation of the young women students of the university. Few fathers and mothers would be willing to send young daughters away from home to school if they believed that they were to be denied the watchful care and refining influences of a well conducted home such as it is the aim of the management of the University to afford through its young women's dormitories.

Another urgent need of the University is a separate building for the State School of Mines, to which Professor E. J. Babcock, Dean of the School of Mines, calls attention in his report submitted herewith. At present the School of Mines is most inadequately housed in small rooms at one end of the basement of the building known as Science Hall. This building is used also by the departments of Geology, Physics, Chemistry, Biology and the Medical School. As may be inferred, the building is greatly over-crowded. But quite apart from the need for added room for the School of Mines is the consideration that the presence of the School of Mines in Science Hall is a constant menace to the building, its contents and even the lives of its occupants. The School of Mines makes almost constant use of blow pipes, blast and other furnaces in which are produced temperatures running as high as 3,000 degrees Fahrenheit. The danger from fire from these sources is extreme and imminent and a building used as quarters for a School of Mines should be separate from other buildings and should be constructed as nearly fire-proof as possible. A separate building for the School of Mines might be utilized to advantage also by the chemical department which, next to the School of Mines, is, from the abundance of inflammable material to be found in a department of Chemistry, the most fruitful source of fire. In the interest of property and life these two important departments of the University should be segregated in separate and properly constructed buildings.

Still another pressing need is the constructing of a sewer system which shall connect the sewer system of the University with the general sewer system of Grand Forks city. At present the University drains its sewage into the coulee, upon whose banks the institution is located at a distance of about an eighth of a mile from the University campus. This coulee is stagnant throughout most of the year and the present system of sewage necessitates an open cess pool less than an eighth of a mile distant from the University buildings to the northwest—a direction from which come the prevailing winds. At times the odors from this cess pool are offensive to all upon the University campus. The present arrangement is in violation of the laws of the state, which forbid the discharge of sewage into running or partially stagnant streams. Some of the farmers who have properties along the lower reach of the coulee between the University and the Red River have made repeated protests and now threaten to enjoin the University through the courts from further pollution of the coulee. The University must, therefore, do something, and at once, in the way of making other provision for its sewage. The only possible recourse under the circumstances, is to construct a line of sewer connecting the University with the city sewer at the nearest point, about a mile and a half distant.

In May, of the present year, Andrew Carnegie gave the University $30,000, toward a Carnegie library. A library building which will be adequate not merely for the needs of the institution in the next quarter of a century, but which will be adequate for present purposes, can not be erected for less than $60,000. It would be the height of unwisdom to build a $30,000 building for library purposes on the University grounds. The legislature will be asked at its coming session to supplement Mr. Carnegie's gift by an additional $30,000, and so make possible the construction of a library building which will be adequate to the needs of the institution for the next forty or fifty years. North Dakota can well afford to meet Mr. Carnegie half way. State pride should prompt her to do as well for her own as Mr. Carnegie has done for those who are to him entire strangers and in whom he can have no interest except a purely philanthropic one.

The time had come when the University must acquire the twenty acres immediately to the east of the present campus or see it pass into other hands. All the property between the University and Grand Forks city has recently passed into the hands of real estate companies who are platting it and putting it upon the market. There was no site suitable for the library building on the old campus. The Trustees were confronted with a double embarrassment in securing a greatly needed extension to the campus in the fact, first, of a lack of funds with which to purchase the needed ground, and, secondly, in the fact that the land belonged to William Budge, a member of the Board of Trustees, from whom it would have been manifestly improper to purchase the land, even had the funds been available, without the especial sanction of the legislature. In this emergency, President Merrifield offered to purchase the twenty acres of land immediately to the east of the old campus and to present the same to the University if his offer should meet with the favor of the Trustees. The Trustees were glad to accept the gift and President Merrifield purchased the land at a cost of $4,000, and presented it to the Board of Trustees in the following letter:

"University, N. D., June 13, 1906.

To the Honorable Board of Trustees, University of North Dakota.

Gentlemen: I hereby donate to the State University and School of Mines of North Dakota, subject to your approval, without restriction as to its future use, the twenty acres of land lying immediately east of the campus of the University of North Dakota and extending from University Avenue on the north to the right-of-way of the Great Northern railroad on the south. Possession of this land will be given to the University as soon as the title can be perfected.

Respectfully yours,
Webster Merrifield."

I close this report with a brief quotation from my last biennial report: "The Trustees of the University of North Dakota have entire confidence in the willingness and desire of the legislature to deal with the utmost generosity possible with all her state institutions of higher education, and they leave the matter of the care of these institutions and particularly of that one of which they are the immediate custodians in the hands of the legislature with the assurance that a wise and liberal, rather than a short-sighted and niggardly policy will be pursued by them. North Dakota is no longer a poor state. Wealth has been accumulated here at a rate rarely exampled in the history of commonwealths. The general fund of the state receives annually enough to take care of all the ordinary expenses of administration and to provide with a fair degree of liberality for the growth of our institutions of higher learning.

Respectfully submitted,
GEO. E. TOWLE,
President Board of Trustees.

PRESIDENT'S REPORT.

University, N. D., October 31, 1906.

Honorable Members of the Board of Trustees, University of North Dakota.

Gentlemen: I have the honor to submit herewith my report, as president, of the present condition of the University and of its progress since the date of my last biennial report, June 30, 1904.

The period covered has been one of uninterrupted prosperity and development in the state and country at large, and in this prosperity and development the University has shared in large measure. The past year has been notably the most prosperous year in the history of the University. The student attendance during that time has increased from 637 to 733—an increase of 15 per cent. The increase in attendance of students of purely college grade during this period has been from 201 to 294, or 46 per cent. In other words, the attendance of strictly college grade has increased more than three times as rapidly as the attendance in all departments of the institution. Following is a statement showing the classification of the attendance during the school year 1905-6.

Graduate Department	6
College of Liberal Arts	113
Teachers' College and Normal Department—	
Preparatory Normal	42
Advanced Normal	30
Teachers' College	22
Summer Session	181
Winter School for teachers	43
College of Mining Engineering	19
College of Mechanical Engineering	29
College of Law	72
College of Medicine	3
Preparatory Department	122
School of Commerce	80
	762
Counted twice	29
Total	733

Perhaps the best evidence of the growth of the University in point of numbers is the increase from year to year in the size of the graduating classes. It is, after all, those students who enter the University for prolonged courses of study and who remain throughout the year that, in the long run, receive from the University the greatest good for themselves and reflect upon it in their after lives the greatest credit. The graduating class of 1902 numbered 28 students; of 1903, 33; of 1904, 52; of 1905, 54, and of 1906, 72. The attendance in the graduate department remains the same as two years ago, while the attendance in the preparatory department has suffered a slight decline. While graduate students are welcomed, no effort has been made to attract such students to the University. It has been the policy of the University to maintain strong undergraduate departments and not to emphasize the graduate department until the University shall be in receipt of an income which would seem to justify the great expense which a strongly maintained graduate department always entails.

The falling off in the attendance of the preparatory department during the past two years is only what would be expected, in view of the rapid growth of high schools in the state, and is welcomed as an indication of the fact that it will, in the not distant future, be possible to eliminate entirely our preparatory department as a distinct department of the University. In view of the recent establishment of Teachers' College as one of the co-ordinate colleges of the University, it will probably be necessary permanently to maintain a model high school as a practice department for Teachers' College. The formal establishment of such a model high school will, of course, necessitate a separate building and an independent teaching corps. It is the purpose of the management to establish this model high school as soon as the income of the University shall warrant its establishment. Its numbers will be limited strictly to the needs of Teachers' College for practice purposes and will doubtless be recruited solely from regions remote from already established high schools. There is, of course, the same reason for maintaining a model high school as an adjunct of a Teachers' College as for maintaining a model practice school as an adjunct of a Normal School.

TEACHERS' COLLEGE.

The recently established Teachers' College has enrolled this year 22 students and graduated a class of 6, all young women. The demand made upon this college for teachers for high school positions is greatly in excess of the ability of the college to supply this demand. With the establishment of Teachers' College, the Normal Department of the University will more and more come to supply the demand for teachers in grade work in our city schools and for principals of such unclassified high schools as do not offer more than one or two years of high school work. The degree of Bachelor of Arts is conferred upon those who complete the four years' course in Teachers' College.

THE COLLEGE OF MEDICINE.

This college was first opened for the reception of students at the beginning of the school year 1905-6. For the present only the first two years of a four years' medical course will be offered in the College of Medicine. There is no reason why a two years' medical college at the University should not enjoy as liberal patronage as the College of Law. It will be many years, doubtless, before the University will be in a position to maintain a full four years' medical course, but by offering the first two years of a four years' medical course it will enable those students of the University who are contemplating the study of medicine and who already do in our College of Liberal Arts much of the work offered in the first two years of a reputable medical college, to receive credit on their subsequent medical course for work done in the University.

THE COLLEGE OF LAW.

The attendance of the College of Law during the year recently closed was 72—an increase of 47 per cent over the last previous year. During the past year a night school has been maintained in connection with the College of Law. Students in the night school are required to take three years to complete the course. It is a question whether the time has not now arrived when it will be for the interest of the state and of the University alike to offer a straight three years' course in the College of Law. North Dakota needs not so much more lawyers as lawyers who are better equipped. The introduction of a straight three years' course would doubtless entail a considerable falling off in the attendance of the law school, but it would give the school a much better standing among other law schools of the country. If the lengthening of the course in the College of Law in the State University shall be the signal for a corresponding increase in the requirements for admission to the Bar in this state, the change is likely to result in real benefit alike to the University and to the state.

CARNEGIE LIBRARY.

In the spring of 1906, Mr. Andrew Carnegie offered to give the University $30,000 toward a library building provided the Trustees would guarantee an annual expenditure of $5,000 in the way of maintenance. To this sum the Trustees hope to add another $30,000, and so erect a library building which will be adequate to the needs of the University for the next quarter of a century at least. The new library will be erected half on the old campus and half on the new campus of twenty acres which the University received as a gift at the last commencement. The new building will face the north, will be located a short distance to the north and east of the old Main Building, and will be the central building in the long semicircle of buildings beginning with the President's house on the west and extending, when completed, to a point near the northeast corner of the enlarged campus. The building will be three full stories above ground, will be about 110x70 feet in its main dimensions, and will be built of Bedford sandstone and vitrified brick. The main reading room on the middle floor will be 110 feet long by 42 feet wide. The first and third floors will be devoted to seminar and lecture rooms. The building will be fire-proof throughout. The architects, Messrs. Patton & Miller of Chicago, have built more Carnegie libraries than any other firm of architects in the country and make a specialty of college libraries. The Trustees have authorized Messrs. Patton and Miller to have complete plans of the campus drawn with reference to the location of future buildings and hereafter all buildings erected on the University grounds will conform to this plan.

SUMMER SESSION.

A summer school for teachers has been maintained at the University for the past eleven years. This has been patronized chiefly by the teachers of Pembina, Walsh and Grand Forks counties. In the summer of 1905, the University established in connection with this school a regular summer session, in which the instructors were regular members of the University faculty. The University has made an annual appropriation of $600 for the expenses of the summer session of six weeks, together with the income from room rentals and fees. The attendance at the combined summer school and University summer session for the summer of 1905 numbered 181, and for the summer of 1906, numbered 255. Considering the small expense entailed by this summer session, it may be accounted one of the most economical and useful of all the sessions of the University. Students taking double courses in the summer session receive for the same a full term's credit, applicable toward the B. A. degree. The summer school for the past eleven years and the combined summer school and summer session for the past two years have been in charge of Professor Joseph Kennedy, Dean of Teachers' College.

CHANGES IN INSTRUCTIONAL FORCE.

Since the date of my last report the following changes have been made in the instructional and administrative force. In June, 1905, Mrs. Alice W. Cooley, assistant Professor of Education, resigned her position after several years of most efficient service, and was succeeded by Dr. A. J. Ladd, a graduate of the University of Michigan, who came to us in September, 1905, as assistant professor of Education and was promoted to a full professorship of Education after one year of service.

In June, 1906, Miss Mary E. Donovan, after two years of service as preceptress and instructor in English, resigned her position and was succeeded by Miss Ella L. Fulton, a graduate of Kalamazoo (Mich.) College and for several years preceptress at that institution.

In June, 1905, Mr. Howard L. Schug, B. A., instructor in German and Latin, resigned his position and was succeeded by Mr. Samuel J. Pease, M. A., a graduate of Northwestern University and the University of Chicago.

The following additions have been made to the instructional force since the date of my last report:

Mr. W. M. Oates, to be instructor in Stenography and Typewriting; Mr. Frederick H. Koch, B. A., a graduate student of Harvard University, to be instructor in Public Speaking and English; Miss Mary R. Brennan, M. A., a graduate of the University of North Dakota, to be instructor in English; Mr. Charles H. Clapp, a graduate of the Massachusetts Institute of Technology, to be instructor in Geology and Mineralogy; Robert T. Young, Ph. D., a graduate of the Universities of Pennsylvania and Nebraska, to be instructor in Biology; Jens M. Rysgaard, M. A., a graduate of the University of North Dakota, to be instructor in Mathematics; Miss Minnie E. Pike, to be physical director for girls; Archie L. McDonald, B. A., M. D., a graduate of the University of North Dakota and Johns Hopkins University, to be instructor in Anatomy; Mr. George A. Stout, to be instructor in Music; Mrs. Marion R. Field, to be instructor in Drawing; H. M. Wheeler, M. D., to be lecturer in Surgery; John Duncan Taylor, M. D., to be lecturer in Pathology; August Eggers, M. D., to be lecturer in Medicine; M. H. Brennan, Ph. B., to be special lecturer in law; Henry M. Gray, to be special lecturer in Law.

WESLEY COLLEGE.

Since the date of my last report to the Methodist Church in this state has removed its educational institution, known as Red River Valley University, from Wahpeton, and has re-established it under the name of Wesley College, on a tract of land recently purchased, immediately north of the University campus. The students of Wesley College will do all their purely academic work in the University—which it is their right to do as citizens of the state—but will take, before graduation, one full year of work of a quasi-theological character such as New Testament, Greek, Hebrew, Church and Bible history and Theism, under the instruction of the faculty of Wesley College. Upon graduation they will or may receive the degree of Bachelor of Arts both from the University and from Wesley College. This arrangement relieves the church of the expense of maintaining costly courses of instruction of a purely secular character and expensive libraries, museums and laboratories, while giving its young people all the advantages of a great state institution of learning, combined with the special, semi-professional training and religious culture of a professedly religious school distinctly denominational in character. On the other hand, the arrangement redounds quite as much to the advantage of the state school as of the church school, the former gaining in spiritual uplift and quickening fully as much as it contributes in the way of intellectual stimulus. Sooner or later the affiliated church school will doubtless develop into a full theological seminary. The form of affiliation here adopted resembles in some of its features the plan in operation at the two great English Universities, Oxford and Cambridge, at the three great Canadian Universities, Toronto, McGill and the University of Manitoba, and at half a dozen American state universities, notably at Michigan University and the University of California; but it is entirely unique in the respect that no work is here duplicated in the two institutions, while in the cases cited above almost all the scholastic work is duplicated in the central institution and in each of her affiliated colleges. The North Dakota plan, as it has come to be widely known, is most warmly commended by practically every state university in the country, as well as by most of the prominent educators, whether in church or state, and by many men eminent in industrial and commercial life, like Mr. James J. Hill, who not only gives the scheme his unqualified and enthusiastic endorsement but has contributed most generously toward its furtherance. It is believed that this movement of the Methodist church in this state is but the prelude to a similar movement on the part of most, if not all, the other great religious denominations in the state. Last October I was invited to explain "The North Dakota Plan" at a conference on Religious Education held at the University of Illinois in connection with the inauguration of Dr. Edmund J. James, as President of the University, and I am to open a discussion of this plan at the next meeting of the National Association of State Universities to be held at Baton Rouge, La., on the 12th and 13th of November.

NEEDS.

The University has grown during the last few years beyond all precedent and even with the new library building we shall be most seriously crowded for room. Should the recent rate of increase in attendance be maintained during the next two years—and it is likely to increase rather than diminish—there will be fully 1,200 students attending the University before the legislature of 1909 meets. To accommodate this great body of young people, the University will urgently need at least three new buildings in addition to the Carnegie library, viz., a combined auditorium and armory, which may also be used for the work of physical culture, a new dormitory for young women, and a separate building for the College of Mining Engineering. We are the only educational institution in the state totally without provision either for an auditorium or a gymnasium. Two years ago we were compelled to abandon military drill for want of a suitable drill hall, although the law creating the University specifies the military department as one of the co-ordinate departments or colleges of the University. The University does not feel justified in view of the many demands being made upon the state treasury, in asking at the present time for an appropriation for a separate auditorium building. For the present the building which should serve primarily as an armory or drill hall could be used also for an auditorium and a place in which to carry on the work in physical culture. There is no work to which educational institutions throughout the civilized world are devoting more careful attention at the present time than to providing for the adequate physical training of the young people under their charge. No better definition of the proper aim of education has ever been given than that given by the poet Horace, nearly 2,000 years ago, namely, "Mens sana in corpore sano"—A sound mind in a sound body. One thing is sure—without a sound body there can be no such thing as a sound mind or sound morals. It is a mistake to suppose that young people reared on the farm and used to hard manual labor at home do not need systematic physical exercise while in school. It is these very young persons who need such exercise the most. A very large part of all the sickness which we have at the University is directly attributable to the cessation of physical exercise on the part of young people who have been used to such exercise on the farm. Young people reared in town and not accustomed to systematic physical exercise suffer far less on the whole from a sedentary life than do young people who come from the farm. The University, in common with every reputable institution of learning in the country, employs a special director of physical exercise both for the young men and the young women. These directors are as much entitled to adequate rooms and appliances for the efficient carrying on of their work as are the instructors in any other departments of the institution. In every important college or university in the country the gymnasium is one of the costliest and most elaborately equipped buildings connected with the institution. It is a mistake to suppose that the athletic contests which occupy the public attention for three or four weeks in the fall term of each school year constitute the whole or any important part of the systematic work in physical culture, or are in any sense representative of the benefits accruing therefrom. North Dakota wants her coming citizens to be not only morally sound and intellectually well balanced but to be physically vigorous and robust—to have, in short, in the aphorism of Horace, "sound minds in sound bodies."

An experience of nearly a third of a century as a teacher has confirmed me in my belief in the wisdom of the dormitory system in an institution of higher education. The absence of dormitories generally in our state universities constitutes, in my judgment, the chief weakness of those institutions. A college or university without dormitories is always sadly lacking in a spirit of solidarity among its students, of institutional loyalty, and what is usually known as esprit de corps. No one who has attended for some years one of the older New England colleges or one of the great English Universities would put a lower rating upon the benefit received from the dormitory life than upon that received from the class rooms, the library and the laboratories. But quite apart from this consideration, there is a special reason in the case of our state university for maintaining dormitories for young women at least. The University is located on the open prairie two miles from town; and, while a local street car line, which was built for the sole purpose of serving the University, affords a comfortable means of conveyance between the town and the University, still the cost of getting back and forth for a person living in town amounts to fifteen or twenty cents a day and adds very considerably to the cost of a year's attendance at the University. Grand Forks is a rapidly growing town and it is almost impossible for young people to get comfortable rooming and boarding places in the city at rates which are not beyond the means of the average student. For this reason and for the added and even more important reason that young women living in town cannot, in the nature of things, be under much supervision by University authorities, it seems to me not only highly important but absolutely necessary that the state provide for its young women at least adequate dormitory accommodations at the University. The taxpayers of North Dakota are not less anxious that the moral well-being of their daughters be properly safe-guarded than that their mental faculties be adequately trained. At present, to the extent of the capacity of the dormitories, students are provided wih room and board at the University at a cost of $3.50 per week. Equally comfortable accommodations in town cost from $4.50 per week upwards. At present the larger part of the young men are compelled to live in town, and for such it is necessary, with rare exceptions, to secure lodging in one place and board at a considerable distance, often at one of the numerous restaurants in the city, where it would be embarrassing, if not improper, for a young woman to go for her meals. During the past year by far the larger number of young women were lodged four in a room, and even with such crowding it has been necessary to send many of them into town to live, oftentimes in the face of strong protests from their parents.

Scarcely less urgent is the need of a separate building for the College of Mining Engineering. The present quarters of this college in the south end of the basement of Science Hall are not only ridiculously inadequate but are a daily and hourly menace to life and property. The constant use of blow pipes and furnaces in which temperatures run as high as 3,000 degrees Fahrenheit should be allowed only in a detached building constructed as nearly fireproof as possible and devoted exclusively to the work of the School of Mines and the department of Chemistry, which is an essential adjunct of such a school, and which is itself, from the combustible nature of its stores, a fruitful source of fires.

REPAIRS.

During the past summer the old Main Building erected in 1883 has been thoroughly renovated within and without. The building was built originally at a time when all constructional work in this state was poorly done. The walls were plastered with a soft plaster which had to be constantly patched and renewed. The floors were of soft wood which had become badly worn, in many cases worn through to the lining. The window and door jambs, poorly constructed originally, had become so shrunken as to make an entire side of the building uninhabitable whenever the wind blew strongly from that quarter in the winter season. While the interior was both originally defective and had become badly worn, the main walls of the building were in an excellent condition, and now that the building has been repaired, the Main Building, as it has come to be known, is practically as good as new and will undoubtedly render efficient service for the next fifty years.

Even more pressing than the needed repairs to the buildings was the need of a fire-proof vault for the protection of University records. The University, up to the past summer, was entirely unprovided with a vault and the records accumulated since the opening of the institution in 1884 would almost certainly have been destroyed had a fire broken out in the Main Building, in which were located the offices of administration. In view of the imperative need of the vault and the scarcely less imperative need of such repairs to the Main Building as would render it habitable, not to say comfortable, in severe winter weather, and in view of the added fact that the Trustees had no means with which to make the needed repairs and to construct a vault, they asked the governor of the state to meet with them at their meeting in May, last, to see whether some provision might not be made by the Emergency Board for providing the institution with a vault and for making the repairs indicated. The Governor at once realized the situation, and after consultation with the members of the Emergency Board, authorized the Trustees to go ahead with the improvements, which have been made. These improvements have cost $18,235.05 and the Emergency Board have undertaken to meet this expense out of the general fund.

HEALTH AND DISCIPLINE.

The health and discipline of the University during the past two years have been exceptionally good, even for the University, which has never known an epidemic or any serious outbreak of disorder. There are few more orderly or more healthy communities, inside or outside of college walls, in this country. Our winters, though long and tedious, are singularly healthful and stimulating, both mentally and physically. This characteristic of our climate, added to the regularity of life of our student body, safe-guarded as it is from dissipation and undue excitement, can but be conducive to sound health and studious habits. An added safeguard lies in the fact that most of our students have but little spare money. Extensive allowances from home are, in all institutions, one of the most prolific causes of poor health and dissipation among the student body.

Respectfully submitted,
WEBSTER MERRIFIELD.

APPENDIX I.

REPORT OF THE DEAN OF THE COLLEGE OF LIBERAL ARTS.

University, N. D., October 29th, 1906.

To the President of the University:

Sir: I have the honor to submit herewith my report as dean of the College of Liberal Arts for the biennial period ending June 30, 1906.

REQUIREMENTS FOR ADMISSION.

The requirements for admission have been raised from thirteen to fourteen year-courses of study. The required courses remain, as before, rhetoric and composition, outlines of English literature, music and drawing, algebra, geometry, physics, and history; but in 1907 and thereafter, among the electives two years of some one foreign language must be offered.

ATTENDANCE.

The increase in attendance has been very gratifying, the attendance of the academic year 1905-1906 being 37 per cent greater than that of 1904-1905. Of the students enrolled in this college during 1905-1906, not quite two-sevenths obtained their preparation for entrance, in whole or in part, in the preparatory department of the University. The preparatory department is, therefore, no longer the principal, or even a very important, feeder of the college. This function the constantly increasing number of rapidly developing high schools in the state is performing and performing well, and we may hope with confidence, I think, that the time is not distant when we shall be able to dispense with this department, as a department of the University. But its retention, in a somewhat changed form, as an adjunct of Teachers' College, serving it as a model high school, may still be found desirable.

INSTRUCTION.

The courses of study pursued during 1904-1905 were:
Biology 2 and 6.
Chemistry 1, 2, 4 and 5.
Education 3 and 4.
English 1, 3 and 4.
French 1, 2 and 3.
Geology 1.
German 1, 2 and 3.
Greek 1, 2 and 3.
History 4, 5 and 6.
Latin 4, 5 and 6.
Mathematics 1, 2, 3, and surveying.
Philosophy 1 and 2.
Physics 1 and 2.
Political and Social Science 1, 2 and 4.
Scandinavian 1, 2 and 3.
Spanish 1 and 2.

During 1905-1906:

Biology 3, 5 and 6.
Chemistry 1, 2, 4 and 5.
Domestic Science 1, 2 and 3.
Education 3, 4 and 6.
English 1, 2, 3, 5 and 6.
French 1, 2 and 3.
Geology 1.
German 1, 2 and 3.
Greek 1 and 2.
History 3, 4, 5 and 6.
Latin 4, 5, 6 and 10.
Mathematics 1, 2, 4 and surveying.
Philosophy 1 and 3.
Physics 1 and 2.
Political and Social Science 1, 2, 3, 4 and 7.
Scandinavian 1, 2 and 3.
Spanish 1.

REQUIREMENTS FOR GRADUATION.

Philosophy, formerly one of the courses prescribed for graduation, is now elective with history and political science. Furthermore, the requirements for graduation, which before included only prescribed courses and free electives, have been changed so as to include: (1) prescribed courses; (2) courses elective within groups; and (3) free electives. As stated in the catalogue, the prescribed courses are such as are thought essential to a liberal education; the courses elective within groups prevent smattering and secure the benefit of advanced work in some line; while the free electives afford the opportunity either for a broader culture or for greater specialization, as the student desires.

(1) Prescribed Courses—
English 1.
A course in History, Political Science, or Philosophy.
A course in one of the Natural Sciences.
Two courses in a language other than English.

Students who enter with only one Natural Science must elect one different from that offered for entrance.

(2) Two courses must be elected from each of three of the following groups; or three courses from each of two of them; or four courses from one of them:

Group 1—English Language and Literature.
Group 2—History and Political Science.
Group 3—Latin and Greek.
Group 4—Mathematics and Physics.
Group 5—Modern Languages.
Group 6—Natural Sciences other than Physics.
Group 7—Philosophy and Education.

(3) Free electives sufficient to secure with the courses under (1) and (2) the required total of 50 "units", a unit being the credit which a student whose grade is C, or D (provided he does not get more than two D's that same term), receives for the completion of a term's work of not less than four recitations a week in one subject.

Courses sufficient to secure a credit of two units may be chosen in physical culture.

Young ladies may choose one or two of their free electives from the courses offered in domestic science.

Young men who enter without manual training or shop work, may choose one of their free electives from the courses in shop-work offered in the College of Mechanical Engineering.

The privilege of counting towards the degree of Bachelor of Arts the equivalent of four courses from the courses of instruction offered in the College of Law, or certain of the courses required for an engineering degree—a privilege which enables a student to shorten the time required for the completion of a liberal and a professional education—is still accorded, and has been taken advantage of by several of our graduates.

EXTRA CREDIT FOR QUALITY OF WORK.

Somewhat more than three years ago, the Faculty, in trying to solve the problem of how to shorten the time required to obtain the bachelor's degree without lessening the degree's educational value, decided to consider the quality as well as the quantity of a student's work in determining his fitness for graduation. Accordingly, a system of extra credits for quality of work was adopted; but the system adopted was soon seen to be too liberal, and so, in the spring of 1905, it was changed and is now as follows:

A student graded A in any course receives a credit of 1.3 units (i. e., .3 extra credit) toward graduation; a student graded B receives a credit of 1.2 units (i. e., .2 extra credit); a student graded C receives a credit of 1 unit; a student graded D may or may not receive credit If in any term he receives not more than two D's, he is given a credit of one unit for each; but not more than two credits are given for D grades in any term. Moreover, an E, an F, two D's, or three C's invalidate all claim to extra credits on other grades received the same term; but a grade in Physical Culture does not affect the values of grades in other subjects.

It may be of interest to note that, while the University of North Dakota was the first in the United States to adopt the plan of giving extra credit toward graduation for quality of work, Columbia University, about two years ago, adopted quite independently a similar plan. Such a plan seems to me entirely just, and will, I doubt not, be more and more widely followed.

GRADUATE INSTRUCTION.

The College of Liberal Arts has offered graduate courses of study for some years past, and has achieved creditable results in this field; but the work has been carried on under difficulties owing to the overburdened condition of the teaching force and to insufficient laboratory and library equipment. It is my hope, however, that these deficiencies will be remedied in large measure in the not distant future, and that the College will be adequately equipped for this, in the judgment of many eminent authorities, the characteristic work of a real university.

Respectfully submitted,
GEORGE S. THOMAS.

APPENDIX II.

REPORT OF THE DEAN OF THE TEACHERS' COLLEGE AND NORMAL DEPARTMENT.

University, N. D., Oct. 29, 1906.

To the President of the University.

Sir:—I beg leave to submit the following report of the Teachers' College and the Normal Department for the biennial period ending June 30th, 1906, and to state briefly some of their needs:

THE NORMAL DEPARTMENT.

The curriculum of the Normal Department has remained substantially the same as during previous years, requiring for its completion, five years above the eighth grade, or grammar school, and two years above a first class high-school course, or above the preparatory curriculum still offered at the University. These five years of work above the grades, including two years' work of college rank, are spent upon both academic and professional subjects.

There were enrolled as regular students in the Normal Department proper, during each of the last two years, over one hundred persons preparing to teach. Besides these there were also enrolled, on the average, each year, two hundred teachers in the Summer Training School, and about fifty in the Winter School for Teachers, making a total enrollment each year, of over three hundred fifty persons attending the University for their better preparation as teachers for the common schools of the state. We could, I feel sure, greatly increase, if not double our regular enrollment if we should shorten our course to four years instead of five, or in other words, to confer our diploma on high school graduates at the end of one year, as in the Normal Schools under the supervision of the State Normal School Board; but so far our faculty has thought best to keep the standard high and to hold to the five-year course for graduation.

THE TEACHERS' COLLEGE.

In 1905 the Teachers' College was organized for the preparation of teachers for the **high schools** of the state. Its curriculum extends two years beyond that of the Normal Course and is, like that of the other colleges, a full four years' curriculum, unless a student be able to reduce the time, on account of the excellence of his work, by our system of giving credit for quality. The graduates of the Teachers' College are granted the B. A. degree and the Bachelor's diploma, the former being the usual evidence of collegiate scholarship and the latter, of special professional preparation. The plan is similar to the one in vogue at Columbia University, New York City. The Teachers' College was organized to supply the urgent demand on the part of high school boards in the state for college-bred men and women who should also be professionally trained. We felt that the State University was in duty bound to supply this demand and thus not compel the high schools of North Dakota to depend, for their supply of teachers, on the higher institutions of learning in eastern states. It is gratifying to note that the High School Council, at its meeting at the University in the spring of 1906, unanimously endorsed the establishment of the Teachers' College and pledged to it their hearty co-operation and support.

During its first year the Teachers' College enrolled twenty-two members, five of whom having come into the senior year from the College of Liberal Arts, were graduated. These were: Mrs. Grace B. Putnam, County Superintendent of Eddy County, New Rockford; Miss Frances Sanderson, now employed in the High School at Hillsboro; Miss Mary Collinson and Miss Laura Gretzsinger, both of whom are teaching in the High School at St. Thomas; and Miss Jean Carr of Minot, North Dakota.

Mrs. Alice W. Cooley, who had been associated with me in the purely professional work of the Normal Department, resigned in the spring of 1905 and Dr. A. J. Ladd was chosen as her successor there and in the Teachers' College. The following professional subjects are offered. Elementary psychology, special and general methods, school management, the history of education, educational psychology, child study, grade and high school management and problems, the study of comparative systems of education, and the science and philosophy of education. In addition to the above, most of the departments of the University offer special professional courses to the juniors and seniors in the Teachers' College, in order that they may become familiar with the special problems, the best ways and means, the text books, etc., in the subjects which they are soon to teach.

AN URGENT NEED.

Thus far neither the Normal Department nor the Teachers' College has had for its students the opportunity offered by what is known as a "Model School." This does not mean, necessarily or in fact, primarily, a "practice school," though some practice might there be advantageously required. But it would mean a model school where our student teachers might daily observe the most skillful teaching with the most improved equipment in every way, and where they might see and study the actual problems of the grades and the high school as concretely illustrated there both in instruction and in school management. A model school of this kind is absolutely essential to the highest success of the Normal Department and the Teachers' College. We have labored as well and as faithfully as we could without such a school for the last fifteen years and we feel that now, since the state is financially able, it should complete a work so long left incomplete.

The cost of a first class Model School, one that would be a credit to the state and to the Teachers' College of the University, would not be great. At present the University maintains a preparatory department, the instruction alone in which costs over $5,000 a year; and it is therefore expensive instruction. The regular departments of the University now give this instruction, because instructors are employed to teach college courses also. The time is becoming opportune to drop the Preparatory Department, as a preparatory school for entrance to college. It would be much better to separate students and classes according to grade.

If, now, we had a well appointed and well equipped building for a Model School in connection with the Teachers' College and the Normal Department, the present Preparatory Department could be dropped. In this Model School building would be done the work or most of the work of a first class high school and it would have in addition, one or, later, possibly two rooms for grade work. This latter provision would be of special advantage and convenience to the prospective settlement at or near the University grounds, as well as to the Normal Department of the University.

The most efficient high school instructors throughout the country receive less on the average in the way of salary than the lowest rank of college instructors; and it is my opinion that the total cost of instruction in the Model School would be no greater than that of maintaining a preparatory department. The transformation would be as desirable as it would be easy, for the University ought to dispense with a preparatory department for its own good name and standing, and the Teachers' College should have a Model School for the same reason.

The building and its equipment, then, would be the only expense necessary to the change. I believe the high school interests of the state would heartily recommend and endorse an appropriation by the coming legislature, to thus complete the Teachers' College, whose function is their own welfare, and that no interest would oppose it if the purpose be clearly understood. I sincerely trust that this great need may be urged by yourself and our Board of Trustees as of immediate and pressing importance.

Very respectfully submitted,

JOSEPH KENNEDY.

APPENDIX III.

REPORT OF THE DEAN OF THE COLLEGE OF MINING ENGINEERING.

University, N. D., Oct. 29, 1906.

To the President of the University:

WORK AND AIMS.

Sir:—The past two years have been very satisfactory ones in the College of Mining Engineering so far as growth in numbers and interest in the work is concerned. The instruction given has conformed to the regular curriculum. As will be seen by referring to the courses of instruction, the School of Mines of the University of North Dakota already has a strong and practical course, one which will compare favorably with that of other similar institutions. The work of the college has an excellent standing and thus far the graduates have readily obtained excellent positions and have performed their work creditably. There is a growing demand for well trained mining engineers and many young men in our state are anxious to avail themselves of the advantages offered in this line of work.

The College of Mining Engineering was established and endowed by the United States Government with a grant of 40,000 acres of land. The wisdom of this act is manifest. It provides for a technical education in an industry which is perhaps second only in importance to that of agriculture in building up a commonwealth. The rapid development of our resources has resulted in a demand for the best trained specialists our schools of mines can produce. Those seeking the services of such young men will no longer be compelled to go outside our own state for them, nor will our young men who wish to fit themselves for mining engineers, metallurgists, industrial chemists, etc., be forced to go to eastern states at much greater expense, to secure such an education.

SUPPORT AND RECOMMENDATIONS.

While the work of the college has been carried on with gratifying results, it has not been done without a serious handicap because of the lack of equipment and room. The land grant which Congress made for the School of Mines in this state has now become very productive, yielding an annual revenue of over $10,000 and a total in the last five years of over $32,000. This income would make excellent provision for the various phases of work taken up distinctively by the College of Mining Engineering, but up to this time there has been very little expended for the equipment of this college. Other needs of the University have pressed so strongly that only a very small part of these funds have been set aside for this department, while the bulk of the income has been diverted to other departments. It was the intention of the government that the income from this land should be used for distinctive mining engineering work and for investigation and experimentation related thereto. It is to be hoped that sufficient support will be given to the University so that it will not be necessary to continue the demands on the income which should be diverted to the College of Mining Engineering.

Inasmuch as the state has accepted this endowment from the national government, the state and the university authorities are in honor bound not only to devote the income from the land grant strictly to the purposes of mining engineering specified but also to add to it the share which the state should provide for the support of this work.

Moreover the growth of the college absolutely demands a better equipment in the way of machinery, apparatus and building. The room now occupied especially for mining engineering work in the basment of Science Hall is entirely inadequate. Moreover, the other departments in Science Hall need all of this room and more.

I therefore recommend that provision be made for the erection of a building of reasonable proportions to be used for the College of Mining Engineering and the departments of Chemistry and Geology and Mineralogy, with room for a mineralogical and mining museum. Such provision would not only release for other purposes the much needed room in Science Hall but would also remove the two greatest sources of danger to the building, namely, the furnaces used in assaying and smelting in the basement, and the chemicals and furnaces located on the second floor. There is already a shortage of room in the department of Chemistry, it being necessary under present conditions to double up the classes at the laboratory tables, to the great detriment of the students and annoyance of the instructor.

In any event, some provision for more room and equipment for the mining work will have to be made at the earliest possible moment.

EXPERIMENTAL AND TESTING DEPARTMENT.

Besides the technical instruction in the courses of mining engineering, surveying, metallurgy, and other associated subjects, an important part of the work of the School of Mines is in what may be called its department of experimentation and economic development. This department takes up all kinds of practical investigations of the mineral resources with the view of proving, by actual tests, their economic value, as well as the best methods for their utilization. These investigations require a large amount of time as well as much equipment.

This department of the School of Mines should be developed as rapidly as possible as there are many important problems to be investigated. The hope is to make the School of Mines a department from which the people of the state may secure practical tests or any other aid which can be given in the development of our mineral resources.

Very respectfully,

E. J. BABCOCK,

Dean of the College of Mining Engineering.

APPENDIX IV.

REPORT OF THE DEAN OF MECHANICAL AND ELECTRICAL ENGINEERING.

University, N. D., Oct. 29, 1906.

To the President of the University:

Sir:—I have the honor to submit as dean of the College of Mechanical and Electrical Engineering the following report of the college for the biennial period ending June 30, 1906:

The college established as one of the departments of the university in 1901 has had a steady and most satisfactory growth. During the past year instruction in one or more of the purely technical courses, has been given to fifty-three students classified as follows:

Mechanical Engineering	29
Mining Engineering	14
Liberal Arts	2
Preparatory	8
Total	53

ENTRANCE REQUIREMENTS.

To be admitted to the College a student must have completed the following or work which in the judgment of the Faculty is its equivalent:

(a) Required Courses:

FULL COURSES.

1. Rhetoric.
2. Algebra.
3. General History.
4. Geometry.
5. Outlines of English Literature.
6. Physics.

7-8. Two years of a Foreign Language.

HALF COURSES.

1. Drawing (free hand).
2. Vocal Music and Elocution.

(b.) Four of the following elective courses.

Latin, 1 2, 3, 4.
French, 1, 2.
German, 1, 2.
Spanish, 1, 2.
Scandinavian, 1, 2.
Greek, 1, 2.
English Masterpieces.
Political Science, 1.
Physiography.
Education, 1, 2.
Bookkeeping.
Stenography.
Manual Training.
Chemistry.

Other subjects may be presented as electives subject to the approval of the Faculty. Credits from accredited High Schools are accepted in lieu of examinations.

CURRICULUMS.

The College offers two curriculmus, one leading to the degree of Mechanical Engineer while the other leads to the degree of Electrical Engineer. Both are identical for the first three years, but during the fourth year those students taking Electrical Engineering specialize in the study of electricity while those working for the degree of Mechanical Engineer devote their time to problems in steam, electricity, shop management and other phases of the Mechanical profession.

The following program shows the subjects required for the M. E. and E. E. degrees and the order in which they are taken.

FRESHMAN YEAR FOR M. E. AND E. E.

Fall Term.

English 1.
Higher Algebra.
Elementary Chemistry.
Mechanical Drawing.
Joinery.

Winter Term.

English 1.
Trigonometry.
Elementary Chemistry.
Mechanical Drawing.
Pattern-making.

Spring Term.

English 1.
Analytical Geometry.
Qualitative Analysis.
Mechanical Drawing.
Pattern-making.

SOPHOMORE YEAR FOR M. E. AND E. E.

Fall Term.

Analytical Geometry.
Physics 1.
Chem. 2 (quantitative Analysis).
Descriptive Geometry.
Mechanical Drawing.
Forge Work.

Winter Term.

Differential Calculus.
Physics 1.
Chem. 2.
Descriptive Geometry.
Mechanical Drawing.
Forge Work.

Spring Term.

Integral Calculus.
Physics 1.
Chem. 2.
Descriptive Geometry.
Mechanical Drawing.
Foundry Practice.

JUNIOR YEAR FOR M. E. AND E. E.

Fall Term

Mechanics of Engineering.
Kinematics.
Physics 2.
Machine Design.
Experimental Engineering (a).
Machine Shop Practice.

Winter Term.

Mechanics of Engineering.
Kinematics.
Physics 2.
Machine Design.
Experimental Engineering (a).
Machine Shop Practice.

Spring Term.

Mechanics of Engineering.
Kinematics.
Experimental Engineering (e.)
Machine Design.
Experimental Engineering (a)
Machine Shop Practice.

SENIOR YEAR FOR M. E.

Fall Term

Thermodynamics.
Steam Engineering.
Electrical and Experimental Engineering.
Machine Design.
Machine Shop Practice.

Winter Term.

Thermodynamics.
Steam Engineering.
Electrical and Experimental Engineering.
Machine Design.
Machine Shop Practice.

Spring Term.

Thermodynamics.
Steam Engineering.
Electrical and Experimental Engineering.
Machine Design.
Machine Shop Practice.

SENIOR YEAR FOR E. E.

Fall Term

Steam Engineering.
Electrical Engineering.
Machine Design.
Experimental Engineering.
Machine Shop Practice.

Winter Term.

Steam Engineering.
Electrical Engineering.
Machine Design.
Experimental Engineering.
Machine Shop Practice.

Spring Term.

Steam Engineering.
Electrical Engineering.
Machine Design.
Experimental Engineering.
Machine Shop Practice.

Students are urged to secure as a foundation for their engineering course, a broader cultural training than is obtained by simply conforming to the entrance requirements. Hence they are encouraged, where time and means permit, to take work in the College of Liberal Arts along with their work in Engineering. By carefully selecting his studies a strong student can thus obtain the M. E. and B. A. or the E. E. and B. A. degrees in five years or a fair student can obtain the same in six years This is made possible by certain subjects required for the engineering degrees having been placed on the elective list for the Liberal Arts students.

Work has been given in all courses leading to the degree of M. E. The Engineering students take their work in English, Physics, Mathematics and Chemistry in common with the students of the other colleges, but the remainder of their work is given in this College.

The aim of the college is to give a strong course, combining the practical with the theoretical side of the profession, but to do this it will be necessary to properly equip its various departments. A small outlay in shop equipment will enable the college to meet the probable demands in this line for some time, but as stated in my last biennial report the Mechanical Laboratory has but a small part of the equipment needed. Only a small amount of apparatus has been added during the last two years so that in this respect the college is in about the same condition as two years ago.

The college stands for high grade work, its aim being to produce quality rather than quantity. The result is that the enrollment is not large but a more capable, enthusiastic and harder working body of students would be difficult to find than those registered in this college, all of whom are here for a purpose and doing their utmost to realize it. In spite of the fact that the college needs equipment its graduates are all filling important positions in the engineering field and meeting with unqualified success and in every sense come up to our expectations.

Respectfully submitted,
CALVIN H. CROUCH,
Dean of the College of Mechanical and Electrical Engineering.

APPENDIX V.

REPORT OF THE DEAN OF THE COLLEGE OF LAW.

University, N. D., October 24, 1906.

To the President of the University.

Sir: On behalf of the Law Department of the University of North Dakota, I beg to submit the following biennial report:

The Faculty of the Law Department as constituted at the close of the school year 1905-1906, consisted of Hon. Guy C. H. Corliss, Mr. Luther E. Birdzell, Mr. Bardi G. Skulason, Hon. Robert M. Carothers, Mr. Harrison A. Bronson, Hon. Tracy R. Bangs, Mr. George A. Bangs and Andrew A. Bruce. Special lectures were also delivered during the year by Mr. M. H. Brennan and Mr. Henry M. Gray. Of these Messrs. Bruce and Birdzell devoted their whole time to the service of the school. The school occupied rented quarters in the Clifford Building which were entirely inadequate and the inadequacy of which seriously hampered its work. Provision however has been made for the occupation of the remainder of the floor after September 1907, and after that time the work can be satisfactorily conducted. During the year preceding the last biennial report fifty-one students registered in the school; during the year ending in June 1906, seventy-three were registered. Of the seventy-three registered sixty-three were in the day course and ten in a night course which had been inaugurated at the beginning of the year. In my last report I regretted a tendency for the senior class to largely outnumber the junior on account of the fact that many of the students came from other law schools and only took one year in North Dakota. During the last two years this has not been the case and in the year 1905-1906 the Junior class outnumbered the Senior. During the two years covered by the period the library of the school has been materially augmented by the addition of the Cochrane Library which was purchased by the Legislature for some $10,000. This purchase has increased the number of volumes in the Library from about one thousand to some six thousand. During the biennial period the old system under which the Supreme Court supervised the final examinations and admission to the bar of the students of the school was changed and a Board of Bar Examiners appointed. Up to the present time no student of the school who has been recommended by the faculty as worthy of graduation has failed to pass the examinations of the Board. Altogether the school has improved in facilities, quality of work done and membership. The step will necessitate an increase in expenditure and will two to three years and this should be made as soon as possible. The step will necessitate an increase in expenditure and will decrease, for a time at least, the number of students in attendance. It should nevertheless be made. It should not be made, however, in advance of general legislation on the subject and the passage of a general statute raising the period of study prerequisite to admission to the bar of the state to three years.

Respectfully submitted,
ANDREW A. BRUCE.
Dean of the College of Law.

APPENDIX VI.

REPORT OF THE DEAN OF THE COLLEGE OF MEDICINE.

University, N. D., October 29, 1906.

To the President of the University:

Sir: I beg to submit the following brief report of the Medical College of the University.

In harmony with your suggestion the Trustees of the University made provision for opening the Medical College September 26th, 1905. In addition to the preparatory and academic work, available for students of Medicine, which had been offered previously, by the University, arrangements were made for instruction in Anatomy, Physiology, Medical Chemistry, Medical Physics, and advanced work in Biology.

Seven students matriculated for work in preparatory and academic courses in Medicine during the year 1905-06. During the first year there were fewer courses required than would be called for in any succeeding year. Some provision was made to meet the growing needs in instruction by engaging Dr. Robert T. Young to care for the work in Embryology, Histology and Comparative Anatomy. No provision has been made thus far to care for the work in Pathology, Pharmacology, and to give needed assistance in the two departments of Experimental Physiology and Physiological Chemistry.

The enrollment for 1906-07 is 100 per cent larger than it was during the first year of this biennial period. If suitable equipment, laboratories and instructors are supplied the Medical College, in order that the present courses offered may be given in a satisfactory manner, the attendance of this College will increase rapidly during the next few years. This will come about because the two years of Medical College work in this state supplies a real need. There is a saving of $150.00-$200.00 per student each of these two years to every young man and young woman who does this part of the Medical College course in North Dakota instead of going to some outside Medical College for work which should be done as well here as it can be done in any Medical School in the country. The total saving for the sixty, and more, Medical Students who are studying outside of their own state will be $10,000.00 at least. This saving will increase, of course, as the attendance of North Dakota students at Medical College increases. This saving justifies the expenditure of sufficient money to secure thorough and complete work in all of the Medical College subjects offered in this University.

The Medical College should serve well those who are receiving instruction in the first two years in Medicine. She should serve also the practitioners of Medicine in making speedy and correct diagnosis of contagious and complicated diseases. Perhaps her most important contribution to the welfare of this state will be the service which she should render to the public health officials in detecting, controlling and eradicating contagious diseases.

NEEDS.

To properly perform the first function, teaching well the Medical subjects, which may be offered legitimately in our two years' course, will require the services of three additional, especially trained medical workers, i. e. a Physiologist, a Pathologist, and a Pharmacologist. The employment of these three men would put the Medical College in a position to do exceedingly well all that she now advertises to do. In addition, work in Pharmacy could be done with entire satisfaction. These workers are needed immediately in order to fulfill the first function of this College of the University.

We are already short of proper laboratory room for the work in the Medical College. We must pack up the Museum, a very undesirable method of escaping from our dilemma, or additional laboratories must be secured in other quarters.

We need additional library and laboratory supplies in order to care for the pressing demands of the new College.

With these additions, three workers in specific Medical Work, the proper laboratory room, and the moderate satisfaction of library and laboratory demands for further equipment the Medical College will be able to perform her three-fold service to the Commonwealth, i. e. giving instruction to students in two years of Medicine, assisting the practioners of the state in making diagnoses of difficult cases, and giving the much needed aid to State, County and City Health Officers in maintaining a high sanitary condition in this State.

An appropriation of $15,000.00 should be made for this work each year in order to perform successfully the work which belongs to our Medical College at present. Much more money could be well employed in this College but satisfactory results could be secured so long as the various demands are not greater than at present in North Dakota.

Respectfully submitted,
M. A. BRANNON, Dean.

APPENDIX VII.

REPORT OF THE SECRETARY OF THE BOARD OF TRUSTEES.

State University, Grand Forks, 1904-05.

Balance on hand July 1, 1904	$ 5,750.52
Received from—	
Matriculation	$ 2,165.50
Forfeit Account	1,324.00
Rent	5,167.29
Chemistry Department	434.85
Physics Department	134.25
Biological Department	72.55
Mechanical Engineering Department	199.37
Athletic Association	1,406.20
Power, Heat and Light	269.96
Teamster Account	73.20
Commercial Department	782.17
Library	993.99
Miscellaneous and Law	3,763.86
Geological Department	35.78
Administration	98.87
Repairs	22.29
Exchange Account	5,124.03
State Mill Tax Fund	62,795.85
Interest and Income from Lands	15,325.48
Geological Survey	1,987.60
State Appropriation to Retire Warrants	68,000.00
Boarding Department	20,228.74
Transfers Between Departments	4,148.41
Total	$200,304.76

Expended on—	
Administration	$ 914.12
Advertising	1,616.96
Analysis	244.30
Athletics	81.46
University Athletic Association	1,448.80
Band	347.15
Biological Department	379.15
Boarding Department	19,982.84
Boarding Department Quarters	158.20
Boarding Department, Dishwasher	379.50
Chemistry	867.30
Commercial Department	740.86
Exchange Account	5,256.73
Fire Department	399.08
Forfeit Account	1,323.28
Fountain	104.82

Geology Department	168.00
Geological Survey	612.97
Greek and Latin	24.91
Grounds Department	1,427.23
History Department	114.93
Interest	6,701.94
Janitor Account	2,312.39
Law Department	6,539.27
Lectures	137.79
Library	1,532.20
Mail Messenger Service	91.59
Mathematical Department	200.00
Mechanical Engineering Department	1,216.99
Medical Department	15.45
Military Department	84.46
Mines, School of	1,677.31
Miscellaneous	1,833.91
Museum	6.40
Normal Department	68.55
Nursing Account	63.16
Physics Department	929.99
Piano Account	4.65
Power, Heat and Light	12,407.18
New Engine for Power House	4,319.44
Rent Refunded	103.78
Repairs Account	2,179.84
Salaries	44,715.31
Great Northern Siding at University	2,588.13
Summer School	254.00
Teamster Account	1,139.22
Warrants Retired	71,000.00
Water Rent	474.65
Balance on hand June 30, 1905	1,114.57
	$200,304.76

Bonds and Warrants Outstanding—

1901, 4 per cent Bonds, Chap. 38 Session Laws 1901	$ 50,000.00
Warrants Outstanding, bearing 7 per cent interest	5,000.00
Warrants Outstanding, bearing 4 per cent interest	16,000.00
	$ 71,000.00

State University, Grand Forks, 1905-06.

Summary of Revenue and Expense—

	Revenue.	Expense
Cash on hand July 1, 1905	$ 1,114.57	$
Received from Interest and Income on lands	35,550.27	
Received from 2-5 mill tax	67,700.09	
Received from Students	15,087.00	
Received from other various accounts, including Boarding Department	33,944.14	
Expenditures, July 1, 1905 to June 30, 1906.		137,028.78
*Cash on hand July 1, 1906		16,367.29
Transfers between Departments	6,342.60	6,342.60
	$159,738.67	$159,738.67

Classified Revenue and Expense—

	Revenue.	Expense
Cash on hand July 1, 1905	$ 1,114.57	$
Administration	73.40	1,229.95
Advertising	4.35	2,066.19
Analysis	465.30	404.76
Athletics		94.76
University Athletic Association	602	601.50
Band	111.06	269.29
Bicycle	2.	.37
Bills Receivable		1,449.84
Biology	130.80	747.60
Biological Assistance		747.02
Boarding Department	22,790.58	24,217.27
Boarding Department Quarters	575.	603.79
Boarding Department Dishwasher	172.50	
Celtic Library	100.	
Chemistry	502.08	1,006.98
Commercial	836.53	851.30
Debate Prize		30.
Domestic Science	16.46	37.10
Engineers' Memorial Fund	38.15	31.90
Exchange	1,387.	1,387.
Fire Department		411.34
Forfeit Fees	1,506.50	1,506.55
Fountain		296.48
General		50.
Geology	101.04	268.99
Geological Survey		941.12
Greek and Latin		102.78
Grounds	41.81	2,152.24
History	6.90	122.35
Icelandic Library Fund	849.84	
Interest		1,120.98
Janitor	136.75	2,375.59
Law	4,850.08	4,675.67
Lecture	4.50	156.93
Library	1,258.83	1,919.88
Librarian of Congress	7.26	5.
Carnegie Library Building		120.98
Mail Messenger Service		99.96
Matriculation	2,446.	22.
Mechanical Engineering	238.45	743.49
Medical Department	321.68	543.31
Mines, School of	30.42	915.88
Miscellaneous	500.55	1,516.68
Normal Department		159.72
Nursing Department	12.20	44.84
Philo--Sherman Bennett Prize Income	6.	36.
Physics Department	151.14	662.78
Power, Heat and Light	953.32	12,465.94
New Unit		441.96
Rent	4,947.16	78.10
Repairs	871.44	3,437.01
Repairs on Main Building		236.47

Salary	433.34	56,279.29
Scandinavian Library Fund	3,047.75	702.25
State of North Dakota, from Lands	35,550.27	
State of North Dakota, from 2-5 Mill Tax	67,700.09	
Great Northern Siding at University	1.68	232.23
Summer School	2,062.77	2,651.86
Teamster Account	124.14	1,078.70
Telephone Account	39.98	235.32
Warrants		5,000.
Water Rent	115.	1,284.09
Cash on hand June 30, 1906		16,367.29
	159,738.67	159,738.67

From the cash on hand should be taken $16,000, the amount payable of the Warrants issued at 4 per cent, leaving a net cash balance of $367.29

Bonds and Warrants Outstanding—

Bonds, 4 per cent, Chap. 38 Session Laws 1901	$50,000
Warrants Outstanding, bearing 4 per cent interest	16,000
	$66,000

SALARY LIST—1905-6.

Webster Merrifield	$3,000
H. B. Woodworth	600
John Macnie	2,000
E. J. Babcock	2,250
Joseph Kennedy	2,250
George S. Thomas	2,250
Melvin A. Brannon	2,250
Vernon P. Squires	2,000
John Tingelstad	2,000
C. H. Crouch	2,250
A. A. Bruce	2,500
E. F. Chandler	2,000
O. G. Libby	2,000
G. W. Stewart	2,000
G. S. Perrott	1,500
A. G. Leonard	1,750
James E. Boyle	1,350
William M. Bryant	1,500
Marcia Bisbee	750
J. M. Rysgaard	900
Mary E. Donovan	1,200
Albert J. Becker	1,300
Luther E. Birdzell	1,500
G. J. Sweetland, Jr.	1,350
Archie L. McDonald	750
Samuel J. Pease	1,000
Frederick H. Koch	1,000
Gwendolyn Stewart	1,000
Mary R. Brennan	400
Gertrude Beers	650
C. H. Wallinger	1,300
Cornelia B. White	600

William M. Oates	650
William H. Potter	800
C. H. Clapp	1,000
Marian R. Field	225
A. E. Morrison	1,600
Edith M. Bosard	500
J. W. Wilkerson	1,000
George F. Strong	1,000
A. J. Ladd	1,500
Abby Brayton	450
Ed J. O'Keefe, Engineer	1,080
Daniel Henry, 2nd Engineer	720
Herbert Allen, Plumber	660
Carpenter	660
Four Janitors	2,160
Two Firemen during winter months	450
One teamster	540
	$64,145

Respectfully submitted,
J. W. WILKERSON,
Secretary Board of Trustees.

APPENDIX VIII.

PRELIMINARY REPORT OF THE STATE GEOLOGIST.

University, N. D., Oct. 25, 1906.

Hon. George E Towle, President Board of Trustees of the University of North Dakota,

Sir:—I have the honor to submit herewith my report of the work of the State Geological Survey of North Dakota during the past two years.

Early in 1905 the Third Biennial Report of the Survey was published. Several weeks in January were spent at Bismarck supervising the printing of the report. Later the volume was widely distributed throughout the state and was also sent to those geologists and public libraries of the country from whom requests were received in response to notices sent them.

The State Geologist spent nearly four months during the summer of 1905 in field work, having charge of a United States Geological Survey party which studied the lignite deposits of North Dakota and eastern Montana. The greater part of the season was spent in this state in certain areas which had not previously been carefully examined. The party spent several weeks in southern Billings County where many thick beds of lignite were located, and also worked in Bowman, Hettinger, Dunn, McKenzie, and Williams counties. Many samples were collected and sent to the Coal-Testing Plant of the United States Geological Survey at St. Louis for analysis. Later in the season we followed up the Yellowstone River from its mouth as far as Miles City, locating many lignite beds which are exposed along the river.

While my party was working on the lignite deposits, a second party in the employ of the State Geological Survey and in charge of Mr. C. H. Clapp, a graduate of the Massachusetts Institute of Technology, was making a careful and detailed study of the clays, particularly in the region of which Dickinson is the center and where perhaps the highest grade clays of the state are found. Good brick clays and materials suitable for other products are not, however, confined to this district but have a wide distribution over North Dakota. The white, high grade clays were found to cover a large area, extending north across the Little Missouri to the Indian Reservation, east a few miles beyond Hebron, south nearly to the North Fork of the Cannon Ball river, and west to the divide separating the streams flowing east into the Missouri from those flowing west into the Little Missouri. The clays lie at an elevation of from 2,450 to 2,600 feet above sea level and are confined to the tops of the higher ridges and divides of the region, having been eroded elsewhere. They have a maximum thickness of about 150 feet and cover an area of nearly 8,000 square miles. These white clays overlie the lignite-bearing beds, all the coal of the region occurring at a lower horizon, and are doubtless considerably younger than the strata containing the lignite.

Several hundred samples of clay were collected in the field and during the year were carefully examined and tested in the laboratory by Mr. Clapp. Analyses were also made of many of the clays by Professor Babcock and Miss Bisbee.

During the past summer Mr. Clapp visited all of the clay plants of the state in order to secure full information concerning them, including the methods employed in manufacturing their various products. Additional clay samples were obtained for analysis and testing, together with specimens of brick and tile. The latter will be tested to determine their strength and durability.

There are at present 20 producing clay plants in North Dakota and the industry is in a prosperous condition, most of the companies having all the business they can handle. Several large new plants have been established during the past two years, including those at Grand Forks, Walhalla, Hebron and Wilton.

The following subjects will be treated in the forthcoming report, which will constitute the Fourth Biennial Report of the Survey:

Technology of the clays.
Chemistry of the clays.
Geological formations of the state, important for their clays.
Economic geology of the clays.
Clay industry with reference to North Dakota.
Statistics of production.

It is believed that this report will be of interest and value to the people of the state, calling attention to our great clay resources and describing the best methods to be employed in the manufacture of the different products. It will also make known to outside investors and others interested the value and possibilities of the clays of North Dakota. The increased use of clay products during recent years cannot fail to result in a steadily increasing demand for this class of goods in the future and in the opening of many new clay plants. The report is intended to help the development of the clay industry of the state.

I spent several weeks during June and July of this year in a careful study of the geology of the Pembina Mountain region. This area is of great interest both on account of its valuable clays and cements and because here are exposed, along the deep valleys of the Pembina, Little Pembina, Tongue and other rivers, geological formations which appear aat the surface nowhere alse in the state. The character, relationships, thickness and distribution of these were determined and much information gathered concerning them.

Late in July I went to Dickinson and again took charge of a United States Geological Survey party which continued the study of the lignite area of North Dakota, Montana and Wyoming. The greater portion of August and September and part of October was spent in field work in eastern Montana, the little known and thinly settled region between the Missouri and Yellowstone rivers. Th results of the work of the past season in Montana throw new light on several difficult problems in the geology of North Dakota and illustrate the value of the opportunity afforded the State Geologist to extend his field investigations beyond the limits of his own state. The age of the lignite-bearing beds of North Dakota has long been a disputed question among geologists and it is of the greatest importance that the age and relationship of the formation be determined But they can best be studied in eastern Montana where their relation to formations of known age is well shown and where they yield abundant fossils. While I was engaged in work for the United States Geological Survey the past two seasons much material was gathered on the lignite area as a whole and the North Dakota deposits were compared with those of neighboring states. Through a study of the larger area and the discussion of the various questions which arose with the geologists of the Federal Survey, many new facts and suggestions were gathered with reference to the coal-bearing formations of North Dakota which could not otherwise have been secured.

The results of the work of the State Geologist will be published by the United States Geological Survey in a bulletin on the Lignite of North Dakota. This report will contain the results of the interesting and valuable tests made at the Government Coal-Testing Plant at St. Louis on the lignite of the state. In addition to the many small samples sent in for analysis several car loads of coal were shipped to St. Louis and the lignite was tested as to its gas producing qualities. Of the entire number of coal samples that were examined from all over the United States the lignite of North Dakota was found to be the best as a source of producer-gas, yielding more gas and better gas than any other fuel tested. This means that the lignite deposits of this region are capable of supplying almost unlimited power if the coal is first converted into gas and then used to run gas engines. It was largely the surprising and remarkable showing made by the lignite from North Dakota in the gas tests at St. Louis which led the United States Geological Survey to undertake the investigations which have been carried on during the past two years. The coal resources of the state could scarcely be more effectively made known throughout the country than by the report soon to be published by the Federal Survey

Early in June I made two trips to McLean County to examine a number of pieces of university and school land which had been offered for sale, in order to determine whether they were coal land.

A brief report to the Board was prepared giving the results of the examination.

One of the subjects to be taken up and investigated during the next two years will be cements and cement materials. North Dakota has valuable deposits suitable for the manufacture of cement and these deserve careful study. Work on the coal bearing beds of the western part of the state will be continued and the effort made to determine their age by means of fossils collected from many localities.

The detailed mapping and examination of certain selected areas, such as a county, will be undertaken in the near future. Its surface features, geological formations and natural resources will be carefully investigated. The topographic maps of the United States Geological Survey will be of the greatest service in this detailed work on special areas. Last year a party was at work in the vicinity of Bismarck mapping that region and this season a quadrangle lying just east of Williston has been mapped. By means of the topographic map of the latter area its lignite beds can be correlated and their number and extent determined. The geology of the district can also be mapped in detail and the distribution of the formations accurately shown.

The Federal Survey bears the entire expense of this topographic work in North Dakota but the state receives the benefit of the excellent maps that are published. Many states, such as New York, Ohio and Illinois, bear part of the expense of preparing these maps and it would be greatly to the advantage of North Dakota if it followed their example. The work of mapping within the state would be pushed much more rapidly than at present and several quadrangles could be covered in a season instead of one or only part of one. But a larger appropriation for the State Geological Survey is necessary before such cooperation is possible.

The State Geologist and the Director of the Agricultural College Survey are consulted as to where the mapping shall be done.

Respectfully submitted,
A. G. LEONARD,
State Geologist.

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OCT 1914

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TENTH BIENNIAL REPORT OF THE PRESIDENT OF THE BOARD OF TRUSTEES

OF THE

University of North Dakota

TO THE

GOVERNOR OF NORTH DAKOTA

Including the Reports of the President and the Deans of the several Departments, the Report of the Registrar, the Report of the Secretary of the Board of Trustees of the University, together with the report of the Director of the State Geological Survey and the Director of the Public Health Laboratory

BISMARCK:
TRIBUNE, STATE PRINTERS AND BINDERS
1908.

[illegible]
OF THE
UNIVERSITY OF ILLINOIS
14 OCT 1914

TENTH BIENNIAL REPORT

OF THE

University of North Dakota

TO THE

GOVERNOR OF NORTH DAKOTA

For the Biennial Period
Ending June 30, 1908

BISMARCK:
TRIBUNE, STATE PRINTERS AND BINDERS
1908.

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REPORT OF THE PRESIDENT OF THE BOARD OF TRUSTEES

University, N. D., November 5, 1908

Hon. John Burke, Governor of North Dakota:

SIR: I have the honor to submit herewith my report as president of the board of trustees of the State University for the biennial period ending June 30, 1908. I also transmit herewith the reports of the president of the University, the deans of the several colleges, the registrar, the librarian, the director of the public health laboratory, the director of the state geological survey and the financial report of the secretary of the board of trustees for the same period. As the trustees are charged mainly with the care of the University in financial matters, my report must necessarily deal largely with the finances of the institution and particularly with its needs at the present time. As the report of the secretary of the board indicates, the trustees have run the institution during the period under consideration within the appropriations and the income from other sources. To do this has required the constant and most careful attention both of the president of the University and the board of trustees and the practice of every possible economy. Indeed, it has been necessary in repeated instances to deny requests for increased facilities and for greatly needed repairs, even when the granting of such requests, had it been possible, would have greatly promoted the growth of the University along important lines and served as an economical conservation of the property of the state. In many instances it has been impossible, in view of the curtailed income of the institution, to take even the "stitch in time which saves nine" in the matter of repairs. Could the trustees have spent from one to two thousand dollars during the past summer in greatly needed repairs to buildings, it would have saved the state that amount of money several times over. Not only has it been necessary to practice the utmost economy in the matter of repairs, but it has been necessary for the board of trustees to deny strongly urged and greatly needed additions to the teaching force as well as to defer various increases in salary which were richly earned and which in simple justice should have been made—increases which, in some instances even, had been promised as a part of the inducement offered to bring new instructors to the University a year or more ago, and which promises ordinary good faith would have required the board to keep had the income of the institution been sufficient. The reduction in the mill tax two years ago reduced the anticipated income of the institution by something like $16,000 for the first year of the operation of the Purcell law. The increase in income during the same period from the increase in the assessed valuation of the state for purposes of taxation amounted to less than $6,000, making a total loss of income for maintenance of more than $10,000. This, of course, necessitated the most heroic cutting of expenses in every possible direction, especially in view of the bill passed at the last session making it a felony for boards of management to exceed appropriations.

NEEDS.

The needs of the institution for the next biennial period in the way of buildings are as follows:

(1) A building for teachers college and the model high school. Teachers college was created as an independent college, co-ordinate with the other colleges of the University, at the last session of the legislature, for the purpose of training teachers for the secondary schools of the state in the same way that the normal schools train teachers for the elementary schools of the state. In establishing this college the legislature followed the precedent set by most states in the Union which maintain a state university. It is the practically unanimous concensus of opinion of educators that teachers in our secondary schools should have such a training as is indicated by graduation from a reputable college maintaining a full four years' course and should have, either additional to this training, or as a part of it, at least one full year of strictly professional work. In many states the law requires all teachers in the publicly maintained high schools to be college graduates. This is the minimum requirement imposed by practically every country of western Europe. In Germany a teacher in a secondary school must have completed a four years' university course. In other words, must have such academic training as would be indicated by the B. A. degree in an American college, supplemented by at least two years of graduate work; or, practically, such training as would be indicated in this country by the possession of the degree of doctor of philosophy.

Following somewhat along the same lines, the high school board of North Dakota has adopted the following rule:

"The superintendent, high school principal and assistants in high schools of the first and second classes shall hold the B. A. or equivalent degree from some reputable college or university. Exceptions may, in special cases, be made by the high school board, but the superintendent, high school principal and assistants shall, in cases above excepted, be duly qualified by holding state life professional certificates. The high school board is always to be the judge of evidence upon which to make exception. Further, that the principal of a third class school, if not the holder of a B. A. degree, or an equivalent degree, or of a life professional certificate, shall be a graduate of some reputable normal school, or shall have completed at least two years in some reputable college or university, and shall present satisfactory credentials to the high school board."

While the high school board is not rigidly applying this rule in the case of teachers, other than principals and superintendents, who have been connected for some years with the high schools of the state, it is the purpose of the board strictly to apply this rule in the future in the case of all new teachers in high schools. There are forty-eight high schools of the first and second class in this state and the number is increasing rapidly from year to year. On a conservative estimate, the high schools of North Dakota need from one hundred to one hunder twenty-five new teachers each year to fill regularly occurring vacancies. If it be wise policy for North Dakota to maintain normal schools to train teachers for her elementary schools, it is equally wise policy for her to maintain a teachers college for the training of teachers for her high schools. In the nature of things most of these teachers must be trained at teachers college at the State University. That teachers college is supplying a real want is attested by the fact that the attendance of this college has increased almost 100 per cent in the last two years.

MODEL HIGH SCHOOL.

It is quite as necessary that a teachers college have a model high school for the purposes of observation and practice for its pupil teachers as that a normal school should have a model practice school for its pupil teachers. The state universities which have established teachers colleges within the last three years, and this includes most of them, are rapidly establishing model high schools for purposes of practice and observation. The University, at the close of the last school year, converted the preparatory department, which had been maintained for many years at the University, into a model high school to be used by teachers college as a school of practice and observation. It is expected that the enrollment of this school will be kept uniform at about 200, including the commercial department.

It is one of the most important essentials of a teachers college with its observation and practice school that it surround itself with a professional atmosphere. The pupil teachers must feel that they are members of a school whose sole purpose is to train teachers for the practice of their vocation. If this is to be done, teachers college and its model school must be segregated as far as possible from the other departments of the institution. It must have adequate quarters of its own in which all of its strictly professional work at least shall be carried on. This fact alone would make it imperative that a separate building be constructed for the use of teachers college and the model high school at the University even were there ample room for the accommodation of these two important depertments in the other University buildings. As a matter of fact, however, the present class, library and laboratory rooms at the University are most lamentably overcrowded. In many cases two, three and even more instructors are crowded into the same recitation room. Many of the teachers have no private offices or study rooms where they can carry on their work outside of the recitation period. If teachers college is to have a separate building, it should be adequate not only to meet present needs, but to meet the needs of the college for many years to come. Such a building must be something more than a makeshift. Those who do their work in this building are to go out to be the superintendents, principals and teachers in the high schools of the state. They should be surrounded by an atmosphere of order, of culture, and, so far as possible, by an atmosphere such as can be found only in a building architecturally handsome as well as substantial in its construction. Such a building as is here indicated cannot be built for less than $100,000. The time has come when North Dakota should build for the future. All our educational institutions have suffered more or less from the makeshift policy pursued by the state heretofore, largely, of course,, as a matter of financial necessity. North Dakota is no longer a poor state. According to reliable statistics its per capita wealth is larger than that of any other state in the Union. It will soon have a million inhabitants. Its high schools are growing by leaps and bounds, and the building which the state erects at this time for teachers college, in which its future high school superintendents and principals are to be trained, should be in all respects equal to the buildings which the state has erected at the site of the two state normal schools. For more information as to the needs of teachers college you are respectfully referred to the accompanying report of Dean Kennedy of teachers college.

(2) Another most pressing need of the University is for a separate building for the accommodation of the boarding department. About 350 students lodge either on the campus or in buildings adjoining the campus. All of these are dependent upon the University boarding department for their board. Another year this number is likely to be increased to 400 or 450 as buildings are being erected in the neighborhood of the University which afford opportunities to students for rooming but not boarding. The University is two miles and a half from town and it is out of the question for students rooming on or near the campus to go to town for their meals. The boarding department at present is located in the basement of one of the dormitories. These quarters were fairly adequate when the number of students living on the campus was not more than 150 or 200. For the present numbers, these quar-

ters are entirely inadequate. At present it is necessary to have students come in relays, which not only adds greatly to the work and expense of the boarding department, but interferes seriously with the schedule of work at the University. The present quarters are not only far too small to accommodate so many students, but the arrangement is most inconvenient and wasteful as it has been impossible, through lack of space, to install such labor saving devices as are to be found in all modern hotels. The location of the kitchen in the basement of our largest dormitory is not only inconvenient from the point of view of the boarding department itself, but it is a bad arrangement for the dormitory. In spite of all possible precautions the odors from the kitchen spread through the building and detract greatly from the desirableness of the building for dormitory purposes. Then, too, there is the ever present danger of fire from the boarding department kitchen. The need, from every point of view, of a separate building for the accommodation of the boarding department is an urgent, not to say a crying, need. As a feature of the proposed building, there should be parlors, reception rooms, waiting rooms, lavatories, etc., where, in bad weather, students can go directly from their class rooms and wait for a brief period for their meals rather than be compelled to go to their dormitories at a considerable distance from the class rooms or to wait about the outer doors of the dining room until the meals are ready to serve. The University now numbers practically 1,000 students. The social life of such an institution is one of its most important features. The different societies and classes frequently give receptions and simple "banquets" to each other. There are many semi-public functions given at the University each year by the literary, scientific and other societies and organizations for which it is necessary for the boarding department to cater. The proposed new building for the boarding department will serve as a social center for the University. Here the alumni will meet at commencement time for their social and business meetings and for their annual banquets; here the various classes, departments and other organizations will meet for similar purposes. In this building, too, the University will be able to entertain such educational gatherings as are held from time to time at Grand Forks. It is understood, of course, that these gatherings or banquets do not entail any additional expense upon the University. A charge is made by the boarding department for all such functions sufficient to cover the actual cost, but it is not the purpose of the boarding department to make a profit either from the regular student boarders or from the meals served to such organizations as those named above. The boarding department is conducted in as businesslike a manner as any hotel in the state or country. It furnishes a much better class of board at the price charged ($2.75 per week or $.20 for a single meal) than can be obtained in the city of Grand Forks. It is, therefore, greatly to the advantage of the students that a boarding department be maintained at the University, even for those students who are compelled to live in town; for the fact that board can be had at the University for actual cost serves as an efficient check to rapacity on the part of the boarding house keepers in the city and makes it impossible for them either to combine for the purpose of fixing unreasonable charges to students or to make such charges individually. A number of the state universities located in great cities, like, for instance, the University of Washington at Seattle, maintain a boarding department in order to regulate the price of student board in the city.

Another reason why a new building for the boarding department is greatly needed is the fact that at present there are no adequate provisions for cold storage and root cellars. The boarding department is, therefore, obliged to buy at retail, and, of course, at much higher prices than could be had were it in a position to buy in quantity and store its provisions. The basement of the contemplated building would naturally be used for such storage and cold storage purposes.

There is another most important use to which such a building could be put. Several hundred University students live or lodge in town and either bring their midday luncheons with them or obtain them at the boarding department. On the part of those who bring their lunches there is a great demand for a cup of hot coffee or cocoa or a glass of milk to be taken with the dry lunches, particularly during the winter months. At present it is impossible for the boarding department, with its limited and antiquated facilities, to supply this very reasonable demand on the part of town students. The time has arrived in the growth of the institution when there should be maintained at the University a good restaurant for the accommodation of students who do not live on the campus and for the numerous visitors to the University. The city is two and a half miles distant and it is often exceedingly inconvenient for visitors, friends of students and others, to go into town for a midday meal. The present dining rooms are so crowded that it is practically impossible to entertain visitors.

A building which will be adequate to the needs of the boarding department for the next fifteen or twenty years (and it will be the height of unwisdom to erect a building simply for the present) would cost not less than $50,000. The board, therefore, respectfully requests that an appropriation of $50,000 be made for this purpose.

COLLEGE OF LAW.

(3) Another need of the University at this time is for a building for the university college of law. The college of law, since its establishment, has occupied rented quarters in Grand Forks, and

is at present occupying such quarters, for which the University is paying an annual rental of $1,440. There is the same reason for housing the college of law in a building of its own that there is for housing any other department of the University in a building of its own. In a rented building the state pays taxes, as it does not where the state occupies for its institutions buildings of its own construction. A far more important consideration, however, is the fact that the students of the college of law are segregated from the rest of the University and do not and cannot, isolated as they are, reap the benefit of the *esprit de corps*, which is one of the most important assets of any institution of learning. The present quarters in one of the office buildings of Grand Forks are not at all suitable for the home of the law school. They are far too small, and are situated at the corner of two noisy business streets. With the law school located in a special building on the University campus, the school would have at its command ample space and a quiet environment, and would possess the enormous advantage of nearness to the general library and of a distinctly academic atmosphere. Its students would feel themselves, in a sense and to a degree now impossible, members of the University, and on leaving the institution would carry with them a loyalty and affection for the institution which cannot fairly be expected of them in their present isolated location where their connection with the University is little more than nominal. If the school were located on the University campus in quarters of its own, it would, perhaps, be necessary to employ one or two additional instructors on a regular salary instead of practitioners at the bar who are paid by the lecture. It is by no means certain, however, that this would not be an advantage rather than otherwise. The practicing lawyer is often so busy with his own business that he finds it impossible to make special preparation for his lectures or, at least, adequate special preparation. Then, too, he is often called away unexpectedly and finds it impossible to fill his lecture engagements at the law school. His class, consequently, must either lose the lecture period or some regular instructor must step in at a moment's notice to fill the gap, either giving a lecture upon another's subject with which he is not familiar, or upon his own subject, for which the class has had no opportunity to make preparation. In either case there is a distinct loss to the student. The old established schools rely almost solely upon salaried instructors who devote their entire time to the work of instruction. The law school of the University of North Dakota is now nearly ten years old, and the question arises whether the time has not arrived when it can profitably follow in this respect the usage of the older schools. The trustees would accordingly respectfully recommend an appropriation of $75,000 for the erection of a building for the college of law at the State University.

(4) The trustees feel impelled at the present time to ask for a special appropriation for equipping the University library. As is

doubtless known to you, Mr. Carnegie gave the University, two years ago, $30,000 with which to build a library building. This sum was exhausted in constructing the building, leaving nothing for the installing of stacks and library furniture. An unequipped library building is of little use. It was imperative that a certain number of steel stacks be installed, before the library was removed from its old quarters to the new building. The trustees had no money with which to purchase these stacks and the president of the institution himself assumed the responsibility for the purchase of the stacks to the extent of $1,600 in order to make it possible to occupy the library building at all.The trustees have assumed no legal obligation in the purchase of these stacks. Of course, there is a moral obligation resting upon the University to reimburse the president of the University for this outlay. At least $5,000 should be spent in the next few months in the purchase of additional stacks, reading desks and chairs. At present the reading rooms are supplied with such odds and ends of discarded furniture, entirely unsuited to the new building, as the University was able to pick up. In view of Mr. Carnegie's generosity in giving the University $30,000 for a building, it would be highly unbecoming in the state were it to fail to provide such furniture as will be in keeping with the building donated by Mr. Carnegie. The trustees, therefore, ask for a special appropriation of $5,000 for the purpose of equipping the Carnegie library building with steel stacks and furniture for the reading room.

(5) The trustees would further recommend that an appropriation of $5,000 the made for the next two years for the improvement of the University grounds. The general University campus covers 100 acres of ground. Of these 100 acres, 60 are separated from the campus proper by a coulee, and it will probably never be feasible to use this tract for building purposes. It will naturally be reserved for athletic and other similar purposes. The original campus consisted of twenty acres, and in the main the buildings thus far erected have been constructed on this campus. Three years ago President Merrifield purchased and donated to the University the twenty acres lying immediately east of the original campus, and on this new campus the Carnegie library and the school of mines building have been erected. The trustees have had plans drawn for the landscaping and beautifying of the larger campus of forty acres. Thus far comparatively little has been done in the way of systematic setting of trees and shrubbery on the recently acquired campus and not much more on the old campus. If $5,000 could be available within the next two years for the systematic planting of trees and shrubs and the caring for the some on the new and old campus, the University would have grounds about its buildings which would compare favorably with the state university grounds in other commonwealths. The first cost of setting trees and shrubs and the

caring for them in the early stages of their growth is large. After the first two years this expense will be greatly reduced and doubtless could be taken care of out of the University's regular appropriation for maintenance. At present almost nothing can be spared for this purpose. The trustees would, therefore, respectfully urge that the legislature make a special appropriation of $5,000 for the purpose of beautifying the University grounds.

(6) Another need of the University is for a small appropriation—say, $5,000—for the erection of a greenhouse. The national and state movement for the conservation of our natural resources is demanding many additional services from the state universities. One of the foremost demands is that plants shall be studied in the living state. On account of the long winters this service cannot be rendered by the University of North Dakota unless a laboratory, in the form of a greenhouse, is supplied by the state. The greenhouse is as vitally related to the study of living plants as the library is related to the study of history and literature. Without this equipment the students of plant physiology and the teachers college students, who are preparing to teach the subject of agriculture in the schools of the state, cannot secure the required acquaintance with living plants and their controlling forces.

In addition to supplying this *imperative educational* need in the University a greenhouse, costing the small sum of $5,000, would be of great economical value in providing suitable quarters for starting thousands of trees, shrubs and tender plants for campus planting. The University campus, as already stated, covers 100 acres. Forty acres of this campus have been laid out in walks and drives, lawns, clumps of foliage and flower beds. The campus proper of the University is becoming, year by year more beautiful, and is daily visited during the summer months by citizens of the state and strangers from abroad. The growing season is so short, however, that not until near the close of the summer do the numerous flower beds on the campus make an attractive showing. If flowering plants could be started in a hot house they would be in a condition to bloom, when reset in beds on the campus, fully a month earlier than at present. Were a greenhouse costing not to exceed $5,000 to be erected on the University campus it is altogether probable that it could be made fairly self supporting from the start by furnishing cut flowers for the various social occasions, such as banquets, receptions and other functions given by students or the faculty under the general direction of the boarding department. The expenses of these functions, including the flowers provided, are paid by the students or others by whom they are given. Some of the other state educational institutions have long maintained a greenhouse, and the propriety of their doing so has been unquestioned.

(7) Your attention is called to the report of Dean Crouch of the college of mechanical and electrical engineering. This college has never been adequately equipped, and Dean Crouch explains that there has long been need, becoming every year more insistent, of a more adequate equipment. Dean Couch estimates the minimum cost of such equipment at $21,500. It is hoped that the legislature will see its way clear to appropriate that sum at the present session for the further equipment of the college of mechanical and electrical engineering.

(8) An appropriation of $18,000 is much needed for properly equipping the laboratories and testing department of the school of mines and for carrying on the important work in experimentation and testing of our mineral and allied resources provided for by the last legislature (S. B. 285). Attention has been called to the importance of providing for such in the report and recommendations of the dean of the college of mining engineering, and especially in that portion of the report which gives a summary of the investigations to be carried on by the testing department of the school of mines.

(9) The work of the North Dakota geological survey is at present seriously hampered by lack of funds and with its present appropriation of $1,000, the smallest received by any state survey in the country, it is able to carry on but one or two of the many lines of investigation which should be undertaken at once. It is admitted by all who are at all acquainted with the facts that no single agency can do so much to develop the natural resources of a state as a state geological survey, and over twenty-five states of the Union now have such surveys, the appropriations ranging from $10,000 to $50,000 and over.

The North Dakota geological survey is in need of at least $5,000 annually, to be expended as follows:

For the expenses of field work on coal, clay, cement, buildstone, road materials, etc.	$ 2,000
For topographic mapping in co-operation with the United States geological survey	2,000
For work on underground waters, also in co-operation with United States geological survey	500
For analyses, tests and other laboratory work	300
For office expenses	200
	$ 5,000

The United States geological survey is preparing very excellent and accurate topographic maps of certain areas throughout the country and it urges the different states to co-operate by bearing part of the expense of the work. So far as it is able the federal survey agrees to put a dollar for every dollar appropriated by the state, and it does all the work of making and publishing the maps, the state only bearing part of the expense of the field work. Many of the states, appreciating the great value of the topographic maps, are appropriating large sums in order that the federal survey may be able to push the work of mapping in those states.

The United States geological survey is also anxious to co-operate with the state survey in its investigation of the underground waters of this region, and will also bear part of the expense of this work.

CARNEGIE PENSIONS.

In April last Mr. Andrew Carnegie added five million dollars to the fund which has come to be known as the Carnegie Foundation for the Promotion of Teaching, in order to make it possible to include the state universities as beneficiaries of his benefaction. Mr. Carnegie's letter announcing this additional gift states that it will be necessary for the boards of trustees of state universities desiring to become beneficiaries of this latest grant to make a formal acceptance of the gift on behalf of the commonwealth. The board of trustees at their last annual meeting passed a resolution accepting the gift on behalf of the University. A joint resolution will be submitted at the coming session, providing for the formal acceptance of Mr. Carnegie's gift on behalf of the state. The conditions of the gift make it possible for all professors and assistant professors in state universities, after twenty-five years of service, to retire on a pension regardless of age, and for all professors and assistant professors, after fifteen years of service, to retire on a pension after attaining the age of 65 years. The following rules for the granting of normal retiring allowances have been passed by the Carnegie Foundation:

CONDITIONS FOR THE GRANTING OF NORMAL RETIRING ALLOWANCES

1. Age—To be eligible to retirement on the ground of age, a teacher must have reached the age of 65, and must have been for fifteen years professor in a higher institution of learning. Whether a professor's connection as a teacher with his institution shall cease at an earlier or later age than 65, is a matter solely within the jurisdiction of the professor himself and the authorities of the institution in which he serves.

2. Long Service–To be eligible for retirement on the ground of length of service, a teacher must have had twenty-five years' service as a professor in a higher institution of learning. It is not necessary that the whole of the service shall have been given in accepted colleges, universities or technical schools.

In no case shall any allowance be paid to a teacher who continues to give the whole or part of his time to the work of teaching, as a member of the instructing staff of a college or technical school.

RULES FOR THE GRANTING OF NORMAL RETIRING ALLOWANCES.

1. A normal retiring allowance is considered to be one awarded to a professor in an accepted university, college or technical school, on the ground of either age or length of service. The term professor, as here used, is understood to include presidents, deans, professors, associate professors and assistant professors in institutions of higher learning.

2. Retiring allowances shall be granted under the following rules, upon the application of the institution with which the professor is connected, and in the application it should be clearly set forth whether the retiring allowance is recommended on the ground of age or service.

3. In reckoning the amount of the retiring allowance the average salary for the last five years of active service shall be considered the active pay.

4. Any person of 65 years of age, and who has had not less than fifteen years of service as a professor, and who is at the time a professor in an accepted institution, shall be entitled to an annual retiring allowance computed as follows:

(a)—For an active pay of $1,200 or less, an allowance of $1,000, provided no retiring allowance shall exceed 90 per cent of the active pay.

(b)—For an active pay greater than $1,200, the retiring allowance shall equal $1,000, increased by $50 for each $100 of active pay in excess of $1,200.

(c)—No retiring allowance shall exceed $3,000.

5. Any person who has had a service of twenty-five years as a professor and who is at the time a professor in an accepted institution, shall be entitled to a retiring allowance computed as follows:

(a)—For an active pay of $1,200 or less, a retiring allowance of $800, provided that no retiring allowance shall exceed 80 per cent of the active pay.

(b)—For an active pay of greater than $1,200, the retiring allowance shall equal $800, increased by $40 for each $100 of active pay in excess of $1,200.

(c)–For each additional year of service above twenty-five, the retiring allowance shall be increased by 1 per cent of the active pay.

(d)—No retiring allowance shall exceed $3,000.

6. Any person who has been for ten years the wife of a professor in actual service may receive during her widowhood one-half the allowance to which her husband would have been entitled.

7. In the preceding rules, years of leave of absence are to be counted as years of service, but not exceeding one year in seven. Librarians, registrars, recorders and administrative officers of long tenure, whose salaries may be classed with those of professors and assistant professors, are considered eligible to the benefits of a retiring allowance.

This additional benefaction of Mr. Carnegie's, whereby state universities are included in the provisions of his original gift, has been hailed with approval by the entire country without a dissenting voice so far as we are aware. Mr. Carnegie has given the money outright into the hands of the Carnegie foundation so that no institution or individual taking advantage of the provisions of this gift can become in any way beholden to Mr. Carnegie himself. Having made the gift, he has placed himself beyond the possibility of influencing or interfering in any way with the commonwealth, the institution or the individual which may become the beneficiary of the gift. Even the terms upon which the pensions are granted have been fixed, not by Mr. Carnegie himself, but by the self-perpetuating board of trustees into whose hands the duty of awarding the pension has been given. The board of trustees is made up of such representative men as Charles W. Eliot, president of Harvard University; David Starr Jordan, president of Stanford University; Nicholas Murray Butler, president of Columbia University; Arthur T. Hadley, president of Yale University; Woodrow Wolson, president of Princeton University, and others. Already all those states whose legislatures have met since Mr. Carnegie's additional gift was made on the 6th of April, 1908, have accepted the gift for their several commonwealths. It is not conceivable that any commonwealth should decline to accept the gift for its state university. The state universities becoming beneficiaries of the gift will henceforth be able, for the same salary, to command abler, more scholarly, and more experienced teachers than they otherwise could. With the meagre salaries everywhere given to teachers of all grades, the teacher, particularly if he have a family, must necessarily be haunted by visions of possible want in old age. The Carnegie pension will not only relieve teachers of anxiety on this score and thereby enable them to do their work under the most favorable mental conditions possible, but it will put such a premium upon professorships in a state university that the best men will naturally be drawn to our state universities. The state will be the gainter in another way from Mr. Carnegie's gift. Heretofore boards of management of state universities have been reluctant to ask for the resignation of professors at an age when the intellectual and physical powers of most men begin to decay. The result has too often been that students in our universities have been instructed by men and women long past the vigor and enthusiasm of active life, who should long since have given way to younger and more efficient teachers. It would be the part of wisdom for boards of trustees of these institutions to retire their professors on reasonable pensions, say, at the age of 65, but the legal right of such boards to do so is, perhaps,. a question, and, in any event, even with unquestioned power and the best of disposition, boards of trustees of our state universities are ordinarily prevented from following this course by the limited funds at their disposal. There is hardly a college or university in the land whose faculty, figuratively sepaking, is not encumbered with "dead and down timber" to the great impairment of the total efficiency of the college or university and the criminal sacrifice of the welfare of their student bodies. Mr. Carnegie's noble benefaction for the first time makes it possible for our state universities, at least, to prevent this loss of efficiency on the part of their teaching staffs and this sacrifice of the highest interest of their student bodies, without inflicting a positive hardship upon men and women who have faithfully devoted their lives for a meagre compensation to the institutions which they have served. It is hoped that the members of the legislature soon to assemble will see the wisdom of an early acceptance of Mr. Carnegie's benefaction so far as North Dakota is concerned. It would be a fitting recognition of Mr. Carnegie's benefaction by the citizens of our state if the bill accepting his gift for North Dakota should be passed at the very beginning of the session by a unanimous vote.

THE SO-CALLED AFFILIATION OF WESLEY COLLEGE WITH THE STATE UNIVERSITY.

As there seems to be much misunderstanding as to the relation between Wesley college and the State University of North Dakota, I deem it proper to define this relationship. Wesley college is situated on a campus of its own across the public road from the State University. It occupies its own building, furnishes its own heat and light, and has no financial relations whatever with the State University. Its position with reference to the University is in no wise different from that of any other institution in the state. Its students are privileged, like the children of other tax payers in North Dakota, to take work in the State University and, from their nearness to the Univerrsity they find it feasible to avail themselves of this privilege to a considerable extent. The students may or may not at the same time pursue certain studies in Wesley college. For certain studies pursued in Wesley college credit is given by the University in exactly the same way that credit is given by the University for work done in Fargo college, the State agricultural college, the two normal schools, the State school of science at Wahpeton, and the State industrial school at Ellendale, as well as for work done in reputable institutions of learning outside the state. Wesley college is affiliated with the University no more and no less than are all the institutions noted above. It is possible that a student at the Agricultural college might take certain subjects in Fargo college and might receive credit at the Agricultural college for subjects so taken, either contemporaneously or previously. In giving such credit the State Agricultural college would simply be showing to Fargo college the courtesy which one institution of learning everywhere shows to another institution of similar grade. Wesley college asks and receives no favors whatever from the State University that other institutions do not, from time to time, ask and receive, and that the University itself does not from time to time ask and receive from other institutions of learning. In pursuing certain subjects at the State University and receiving credit for the same, the students of Wesley college, as citizens of the state are simply taking advantage of rights guaranteed to them by the constitution and laws of the state. The invitation in response to which Wesley college was located near the University was embodied in a resolution of the board of trustees which passed the board by a unanimous vote and which, without naming any religious denomination, invited them all, in view of the fact that their members are all citizens of the state and tax payers, to take advantage of the facilities afforded by their state University to whatever extent it might suit their several educational purposes. It is believed that, eventually, all the religious denominations will avail themselves of this invitation to establish guild halls or residence dormitories for their young people in the neighborhood of the state university. The different religious denominations have already done this at several of our leading state universities, notably at the universities of California, Kansas, Oregon, Michigan, West Virginia and Wisconsin; and from all these institutions comes the assurance that the plan is working admirably, and without the slightest friction.

Respectfully submitted,

J. G. Gunderson,

President of the Board of Trustees, University of North Dakota.

REPORT OF THE PRESIDENT TOTHE BOARD OF TRUSTEES

University, N. D., November 5, 1908.

To the Honorable Board of Trustees, University of North Dakota:

Gentlemen: I submit herewith my report as president of the University for the biennial period ending June 30, 1908.

The period covered has been by far the most notable in the history of the institution, whether viewed in the light of student attendance, of important additions to the faculty, of raised standards for admission and graduation, of thorough organization of the institutions into colleges and departments, or of increased facilities for the proper conduct of the work of the institution.

COLLEGES OF THE UNIVERSITY.

The university now maintains the following well organized colleges:

College of Liberal Arts.
Teacher's Sollege.
College of Mining Engineering.
College of Law.
College of Mechanical and Electrical Engineering.
College of Medicine.

While a course is offered in Civil Engineering, it has not been deemed wise in view of the comparatively small demand at present for work in that college, to make it an independent college presided over by a dean of its own. The civil engineering course is at present under the joint direction of the deans of the Colleges of Mechanical and Mining Engineering.

MODEL HIGH SCHOOL.

During the school year 1907-8 the preparatory department, which has been maintained since the opening of the University in 1884, was converted into a model high school, which serves as a practice and observation school for the pupil teachers of Teachers College.

The commercial department, which had been maintained for a number of years as an independent department of the University, is now made a department of the model high school and answers to the numerous commercial high schools which are being rapidly established in all the principal cities of the country. The work of the model high school has been put in charge of Prof. C. C. Schmidt, who was for many years superintendent of the city schools of Jamestown, N. D., and who was recognized throughout the state as one of the ablest, most experienced, and most successful high school superintendents in the state. The course of study adopted for the model high school is a four years' course, identical in all respects with the course maintained in the best high schools of the first class in this state. The University now requires sixteen units for admission to the freshman class (i. e., four subjects pursued five hours a week each year for four years) and requires for graduation from each of its colleges 124 semester hours. These standards are equal in all respects to those required both for admission and graduation by the oldest and foremost universities in the country. For the present the model high school occupies the top floor of the main building together with a number of recitation rooms on the basement floor of the same building. It is hoped that the next legislature will make a sufficient appropriation to make possible the erection of a suitable building for the housing of Teachers College and the model high school.

PUBLIC HEALTH LABORATORY.

The last legislative session made a fixed annual appropriation of $5,000 for maintaining a public health laboratory at the University and an appropriation of $2,000 for installing the same. This laboratory has been in successful operation for two years under the direction of Dr. Gustav F. Ruediger, M. A., Ph. D., University of Wisconsin and M. D., University of Chicago. The laboratory has already amply justified its creation and has, it is believed, completely won the favor of the medical profession of the state. The work of the laboratory has so greatly increased during the biennial period as to render necessary the employment of an assistant with similar equipment to that of Dr. Ruediger.

NEW BUILDINGS.

The last biennial period has witnessed the erection of three new buildings on the University campus. The first of these to be completed was the school of mines building for which the legislature appropriated $20,000 at its last session. This buildings is 74 feet, 4 inches by 56 feet in its main dimensions, is two stories in height above a high basement, and is built of pressed brick in mission style with gray stone trimmings. Owing to the inadequate appropriation the building is much smaller than could be desired, having in view the further growth of the college of mines, but it is fairly adequate to present needs. The school of mines is now recognized as one of the most efficient in the country and students have come to it from some of the oldest and best known mining schools in the United States.

The second of the three buildings to be completed was the University gymnasium. This building is fifty-three feet by 110 feet in its main dimensions, and consists of a basement and a high first floor opening into the roof. Its outer walls are built of a handsome, dark red, vitrified brick of great durability. Bedford stone has been used for the entrance casement, window sills, gable cornices and a narrow belt course between the basement and the upper floor. Here, again, owing to the inadequate appropriation, it was necessary to build a smaller building than could be desired in view of the probable growth of the University in the next few years. This building, however, like the school of mines, is fairly adequate to present needs and for the first time the University has adequate facilities for up-to-date instruction in the important department of physical education.

The new library building, for which Mr. Andrew Carnegie gave, two years ago, the sum of $30,000, was completed during the summer of 1908 and was occupied for the first time by the library at the opening of the present school year. This building is fifty-four feet, three inches by seventy feet, four inches in its main dimensions, and its outer walls, like those of the gymnasium, are constructed of a very handsome, dark red, vitrified brick. Bedford stone is used as a facing for the basement, for the entrance casement, for the window jambs and lintels, and for belt courses between the first and second floors and the second floor and the roof. This building, like the gymnasium, is roofed with red tiling. This is the handsomest building architecturally, as it is the richest in its construction, of all buildings on the University campus. It is, indeed, unquestionably, the handsomest state-owned public building in North Dakota, although not the largest. All three of the buildings named are a great addition not only to the convenience of the University but to its physical appearance. It is, however, regrettable that the legislature should have deemed it necessary to make appropriations for these buildings so small as to meet only the present and pressing needs of the University. It is only a question of a few years before another and much larger library building will have to be built to meet the growing needs of the University; and only a question of a few years, too, when the present gymnasium must either be greatly enlarged or, better, perhaps, a separate gymnasium constructed for the use of the young women. Already every available inch of space in the school of mines building is fully occupied and complaints are numerous that more room is needed for the accommodation of that rapidly growing department.

CHANGES IN INSTRUCTIONAL FORCE.

During the last biennial period the following changes have been made in the instructional force:

Professor Horace B. Woodworth, Professor Emeritus of History died suddenly at his home in Grand Forks in the fall of 1906. Professor John Macnie, who had been for twenty-two years a professor in the University, was made Professor Emeritus of the French and Spanish languages and literatures at the close of the school year 1907.

The following appointments to the faculty were made during the biennial period under consideration:

Gustav F. Ruediger, M. D., Ph. D., to be professor of bacteriology and pathology and director of the public health laboratory.

Gottfried Hult, M. A., to be professor of the Greek language and literature.

John M. Gillette, B. D., Ph. D., to be professor of sociology.

Henry LeDaum, M. A., to be assistant professor (in charge) of the French and Spanish languages and literatures.

C. C. Ssmidt, M. A., to be professor of general and special methods and school administration, and principal of the model high school.

John G. Barry, S. B., to be instructor in geology and mineralogy.

William B. Snyder, B. S., to be instructor in metallurgy and mining.

Martin B. Ruud, M. A., to be instructor in English.

Minnie E. Pike, to be physical director for women.

Chelsea C. Pratt, M. D., to be assistant bacteriologist in the public health laboratory.

D. L. Dunlap, B. Sc., M. D., to be physical director for men to succeed George J. Sweetland, Jr., B. S., M. D., resigned.

A. G. Clow, B. A., to be assistant physical director for men.

George H. Caldwell, M. D., to be instructor in physiology.

Christine H. Boyson, B. S., to be instructor in English in the model high school.

Gola Baker, to be instructor of music and drawing in the model high school.

Kenneth A. Page, M. E., to be instructor in mechanical drawing.

Arthur C. Hargrave, to be instructor in shopwork.

E. T. Whitson, to be instructor in commercial branches.

SUMMER SESSION.

The usual summer school for teachers was held at the University during the summers of 1906 and 1907 with 252 teachers in attendance during the first session and 271 during the second session. The attendance at both sessions was almost exclusively from Pembina, Walsh and Grand Forks counties. The University offers in connection with the summer school for teachers a regular summer session at which students with conditions or back work are given an opportunity to make up their work and other University students are privileged to take work which may count toward their degrees. The two summer sessions were under the direction of Professor Joseph Kennedy, dean of teachers college, who has had charge of this work for the last thirteen years.

ACTIVITIES OTHER THAN TEACHING.

While from the nature of its charter the University is not primarily or chiefly an institution devoted to the solution of problems, economic, educational, social or otherwise, the members of the University teaching staff have been by no means indifferent to these important features of educational work. Our professors respond freely to invitations to address educational and other gatherings and the number of such addresses in the course of the year runs into scores if not into hundreds. Scientific investigations are constantly being carried on at the University and this work is considered not only legitimate and important but necessary and commanding from the very nature of the institution. The issuing of bulletins to make known the results of these investigations is, of course, a function chiefly of certain of the scientific laboratories. Among the numerous papers and bulletins issued from the University during the last biennial period may be mentioned the following of local interest:

Publications by A. G. Leonard, Ph. D., state geologist.

"What should appear in the report of a state geologist?" in Economic Geology, Vol. 1, No. 6, 1906.

"The North Dakota-Montana lignite area," in bulletin No. 285 of the United States Geological Survey.

"Cement industry in North Dakota," and "Coal mining in North Dakota," in Mineral Industry, 1907.

"Stratigraphy of North Dakota Clays," in the Fourth Biennial Report of the North Dakota Geological Survey.

Publications by E. J. Babcock, B. S., dean of the college of mining engineering.

"Water supplies in North Dakota."

"Investigations of kerosene oils and gasoline."

"Uses and values of North Dakota clays."

"Mineralogy notes."

Publications by John M. Gillette, B. D., Ph. D., professor of sociology.

"Initiative and Referendum in North Dakota." Two papers in Valley City Times-Record in 1906.

"Secret societies of the Dakota Sioux." Report of American historical association in 1906.

"Reconstruction of history for teaching purposes with special reference to North Dakota." Grand Forks Herald, 1908.

Publications by O. G. Libby, Ph. D., professor of history.

Editor of volume 1, collection of state historical society of North Dakota. Author of special articles in this volume on the Mandan villages on the Knife river and on the old settlers, T. E. Cooper, Basil Clement, Francois Jeanotte, Louis Sears, and a gazeteer of old settlers.

Editor of volume two, collections of state historical society of North Dakota, preparing for publication the diary of Lewis C. Paxon at Fort Abercrombie in 1862-64 and the log book of C. J. Atkins, Missouri river pilot, 1863-68. Author of article on Typical Indian Villages in the Missouri valley with a discussion on the probable route taken by La Virendru in the region of Turtle mountains and upper Missouri river in 1738.

Published in Westland Educator, Lisbon, N. D. Series of articles on North Dakota history; first article on concrete history.

Paper read before Mississippi valley historical association, Lake Minnetonka, Minn., June, 1908, on "The Mandan Indian from the archaeological and historical standpoint."

Publication by Gustav F. Ruediger, M. D., Ph. D., director of public health laboratory, University of North Dakota.

"Sewage disposal in relation to tyhoid fever.'

Publications by James E. Boyle, Ph. D., professor of economics.

"The constitution or frame of government. A comparative study of the constitutions of the United States and of North Dakota."

"Methods of assessment as applied to different classes of subjects." Reprinted from the addresses and proceedings of the national conference on state and local taxation held at Columbus, Ohio, Nov. 12-15, 1907.

"Currency methods at home and abroad." Delivered before the sixth annual convention of the North Dakota bankers' association held at Bismarck, N. D., July 1 and 2, 1908.

THE UNIVERSITY AND THE HIGH SCHOOLS OF THE STATE.

When I assumed the presidency in 1891, almost my first official act was to take steps to develop the high schools of the state as feeders alike to the University and the other state higher educational institutions. Recognizing the fact that the maintenance of a preparatory department was no proper part of the work of an institution of higher education and the further fact that in any event the University could not hope, through its preparatory department, to train more than a very small percentage of the students who would naturally enter the college classes, at the anual meeting of the educational association held at Grand Forks in December, 1891, I offered to serve at my own expense as examiner of the high schools of the state. This offer was cordially accepted by the high school principals there represented and thus was inaugurated the system which led to the passage in 1897 of the law creating the present high school board and defining its functions. The University, the agricultural college, the two normal schools and the school of science have profited alike and in practically equal measure from this movement. In the nature of things the larger part of the subjects studied is high schools are academic in character, although in the wide range of electives offered the opportunity is freely given to each school to offer such vocational subjects as local conditions may seem to demand. The University has felt that, as the crown of the general system of state education, it owed a special duty to the high schools. In the discharge of this duty it has invited the high school principals once each year to meet at the University for the purpose of discussing courses of study, standards of admission and graduation, and kindred subjects. It is believed that these annual conferences have been of the greatest possible benefit to tthe high schools of the state and incidentally to the University and the other state educational institutions, which have been cordially invited to send representatives to these conferences.

Incidental, though valuable, features of the annual principals' conference held at the University each spring are the interscholastic declamation contest, participated in by some thirty high schools each year, and the interscholastic athletic meet participated in by from fifty to seventy-five high schools of the state. These annual contests and meets give impetus and zest to the practice of public speaking and to the physical side of education in our state secondary schools. Any system of education which neglects the training of the body as well as that of the mind is fundamentally and radically faulty. Every institution of higher learning in the land has as one of its most important building, the gymnasium, and in almost every such institution the department of physical culture is now recognized as one of the most important and dignified departments of the institution. In all the more important colleges and universities, the instructor in physical culture holds the rank of full professor and his professorship is co-ordinate in dignity and importance with any other professorship in the institution, and the same is true of a rapidly increasing number of high schools.

THE UNIVERSITY CONVOCATIONS.

A weekly convocation is held at the University each Saturday morning during the school year. These meetings are opened by brief religious exercises, followed by a formal address. The speakers are carefully selected and in the main bring to their University audience a message of value. During the biennial period under consideration the following addresses have been made at these weekly convocations:

CONVOCATION SPEAKERS FOR 1906-7.

Sept. 30, President Merrifield—Some Conditions of Success.

Oct. 6, Dr. E. P. Robertson—The Philosophy of Life.
Oct. 13, Prof. M. A. Brannon—Citizenship.
Oct. 20, Father Lewis Drummond–Some Aspects of Socialism.
Nov. 3, Prof. Gottfried Hult—Impressions of Greece.
Nov. 10, Bishop Cameron Mann—Oratory.
Nov. 17, University Orchestra–Musicale.
Nov. 24, Program in charge of the Ad Altiora Society.
Dec. 1, Hon. Chas. F. Amidon—The Importance of Literature.
Dec. 15, Dr. Max Batt—Weimar One Hundred Years Ago.
Jan. 5, Frederick H. Koch—She Stoops to Conquer.
Jan. 12, Pres. Wm. Kern—A Student's Major Problems.
Jan. 19, Prof. A. P. Hollis—The School Without Walls.
Jan. 26. Dr. P. G. Knowlton—Freedom vs. Independence.
Feb. 9, program in charge of the Per Gradus Society.
Feb. 16, Hon. Guy C. H. Corliss–The British Constitution.
Feb. 23, Longfellow Program.
March 2, University Orchestra—Musicale.
March 9, Miss Margarethe E. Heisser—The Search for the Beautiful.
March 16, Prof. V. P. Squires–James Russell Lowell.
April 6, Song Service.
April 13, Mrs. Alice W. Cooley—Life Resources.
April 20, Hon. W. L. Stockwell–The University and the State.
April 27, Program in charge of the A. D. T. Society.
May 4, Rev. F. E. R. Miller—The Hoosier Bard.
May 11, University Orchestra—Musicale.
May 17, Dr. Borden P. Bowne—The Passing of Mechanical Naturalism.
May 24, Dr. John M. Gillette–The Significance of Cities in Modern Life.

CONVOCATION SPEAKERS FOR THE YEAR 1907-8.

Sept. 28, President Merrifield—Some Things Seen in Germany.
Oct. 5, Prof. Joseph Kennedy—Our Resonance.
Oct. 12, Hon. H. C. Hansbrough—The American Congress.
Oct. 19, Mr. Peck—Y. M. C. A. Work.
Oct. 26, Prof. Gottfried Hult—An Eighteenth Century Stalwart.
Nov. 2, Mr. E. A. Shuman—South America.
Nov. 9, Rev. C. L. Hall—The Indians of North Dakota.
Nov. 16, Mr. George F. Strong—Strange Stories.
Nov. 23, Program in charge of Adelphi Society.
Nov. 30, President E. M. Vittum—Love and Life.
Dec. 7, Miss Margarethe S. Heisser—The Decorative Element in the Home.
Dec. 14, Prof. V. P. Squires—John Greenleaf Whittier.
Jan. 11, Rev. J. H. Batten—The Masteries of Life.
Jan. 18, Mr. R. B. Griffith—Lessons From the Lives of Three Great Americans.

Jan. 25, Rev. W. H. Matthews—The Well Rounded Life.

Feb. 1, Prof. A. E. Minard—A Glimpse at Primitive Life.

Feb. 8, Supt. F. E. Smith—The Responsibilities Attaching to a University Education.

Feb. 15, Hon. G. C. H. Corliss—Discussion of Hamlet.

Feb. 29, Prof. F. H. Koch—The Theatre Today.

March 7, Program in charge of Forum Society.

March 14, University Orchestra and Glee Club—Musicale.

March 21, Prof. C. C. Schmidt—What a Young Man Should Get Out of His University Course.

April 11, President W. M. Kern—The Money Value of Training.

April 18, Prof. Luther E. Birdzell—Thomas Jefferson.

April 25, Mr. Samuel Torgerson—Sin and Society.

May 2, Prof. O. G. Libby—The Myths of the Dakota Indians.

May 9, Prof. Charlton Lewis—The Utility of Literature.

May 15 ,Hon. W. L. Stockwell—Looking Backward.

May 23, Prof. F. H. Koch—Hamlet.

June 6, Program for Benefit of Lake Mohonk Conference on International Arbitration.

WORK OF THE LITERARY SOCIETIES.

There are ten literary and debating societies maintained by the students at the University, all of them doing honest work, and some half a dozen of them being in a very flourishing condition. We hear so much of the prevalence if not dominance of athletics at our institutions of higher education that it is refreshing to be able to report that no student activity at the University of North Dakota exceeds in interest and importance that of oratory and debate. In debate the University has for many years held a dominant position among the educational institutions of the northwest and, while the paramount object of inter-institutional public debate is not to win, it is gratifying to record that, of the public intercollegiate debates participated in by the University, the University has won a considerable majority. During the last two years the University debated with teams representing the University of Montana, Carleton college, the University of Manitoba and the University of South Dakota.

STUDENT PUBLICATIONS.

In this connection it may be proper to note that the students publish an eight-page weekly newspaper devoted to the University interests, as well as a handsome annual published yearly by the junior class. Both of these are highly creditable publications and compare favorably with similar publications at the oldest and largest universities in the country.

A DEPARTMENT OF DOMESTIC SCIENCE.

Practically one-half of the total attendance at the University is made up of young women. In the nature of things the great majority of these young women will become wives and homemakers. Any system of education which educates the young women of the community away from this function of homemaking or unfits them for the highest efficiency as homemakers is fundamentally faulty. Certainly no feature of any system of education participated in by young women can be more important than that which specifically and of intention trains young women to discharge those most important of all womanly functions, the making and caring for a home. Every institution of learning supported by the state, in whose benefits young women must necessarily be privileged to share equally with young men, should offer thorough courses in domestic science. The University has heretofore been prevented from offering this work because of insufficient funds and the lack of suitable quarters. If an appropriation be made by the legislature soon to convene for the erection of a building for the boarding department at the University, the quarters heretofore used by the boarding department in the basement of Davis hall will become available for occupation by a department of domestic science. In that event, an appropriation of one or two thousand dollars should be made by the legislature for the purpose of adequately equipping these vacated quarters for the use of a department of domestic science. It is devoutly to be hoped, in the interest of the four to five hundred young women in attendance at the University, that some provision will soon be made to give them an opportunity to prepare themselves for the great function of homemaking and homekeeping.

HEALTH AND DISCIPLINE.

The health and discipline of the University during the past two years have been exceptionally good even for an institution in which there has rarely been serious illness and almost never occasion for severe or formal discipline. It gives me pleasure to say in closing this report that during the biennial period under consideration the instructional force has been more efficient than ever before, the equipment of the institution for doing its work more complete and the *esprit de corps* and general tone and spirit of the student body, if not ideal, at least all that could be reasonably expected. The University is performing from year to year a more valuable service to the state and, it is believed, is receiving from year to year a larger measure of confidence and appreciation from the citizens of North Dakota.

Respectfully submitted,
WEBSTER MERRIFIELD,
President.

REPORT OF REGISTRAR

To the President of the University:

SIR: I have the honor to submit my report as registrar for the biennial period ending June 30, 1908.

As detailed information regarding courses of study is given in the different reports from heads of departments, I shall give special attention to matters relative to registration, closing, however, with a complete list of the various courses offered in the seven departments of the University.

The needs of a school depend very largely upon its enrollment not only as to the total number in attendance but the kind of work done. If the majority of the students are doing elementary or high school work the cost of maintenance is simplified. If, however, much of the work done is of advanced college grade, the financial problem assumes more serious proportions. The following statement shows the classification of the attendance at the close of the year 1907-8 as compared with the attendance at the close of the year 1905-6, the time of the last previous report:

	1905-6	1907-8
Graduate department	6	6
College of liberal arts	113	125
Teachers college	52	94
College of mining engineering	19	45
College of mechanical and electrical engineering	29	34
College of law	72	80
College of medicine	3	20
Preparatory department	164	144
Summer school	181	271
School of Commerce	80	69
Winter school for teachers	43	Discontinued
	762	888
Counted twice	29	27
Total	733	861

It will be seen from this table that during the past two years the total enrollment has increased from 733 to 861, an increase of about

18 per cent. In this enrollment we have represented twelve different states besides North Dakota, thirty-five counties of our own state and several provinces of Canada. The number from Grand Forks county is greatly increased by many students who come to make their homes in Grand Forks while attending the University. This is especially true of the older students. During the period covered by this report the increase of attendance of students of strictly college grade, i. e., above the twelfth grade of the high school, was from 294 to 404, an increase of more than 37 per cent. Taking into consideration the fact that the advanced courses are the most expensive to maintain, this fact is an important one. The University continues to enroll a considerably larger number of students of this advanced grade than all the other institutions in the state combined, whether they be state or denominational. The number of students in all departments who may be classed as freshman, i. e., who have completed at least twelve grades of school work before entering the University, now considerably exceeds 150 each year. Perhaps the most accurate test of the real growth of an institution is the annual increase in the number of its graduating class. At the last commencement the University graduated ninety-three students as against seventy-two at the close of the last previous biennial period.

Since the date of the last report, the normal department which had been maintained at the University from the opening of the institution in 1884 has been abolished and with it the winter school for teachers. The preparatory department has been converted into a model high school with limited numbers. These changes are in conformity with the recommendations made by the conference of the heads of the state educational institutions called by the educational committee of the senate at Bismarck two years ago. These changes, it is safe to say, have reduced the total attendance of the University for the past year about 150 students. The University now offers no short courses. As a result the students in attendance at the University, with but few exceptions, enroll at the opening of the school year and remain till its close. We have practically no students for a shorter period than the school year of nine months, so that the total enrollment of the University practically marks its average attendance.

In these days when we hear so much of the vocationalizing of education in all its grades, it is a satisfaction to know that there is an increasing number from year to year of students who are seeking a broad general education as a preliminary to subsequent training for vocations. As stated in the president's report two years ago, while graduate students are welcomed at the University, no effort has been made to attract such students. It has rather been the policy of the institution to maintain strong undergraduate departments and not to emphasize the graduate department until the

University shall be in receipt of an income which would seem to justify the great expense which a strongly maintained graduate department always entails.

Respectfully submitted,
W. Maclay Oates.

CURRICULUMS.

FIRST SEMESTER.

FOR COLLEGE OF LIBERAL ARTS AND TEACHERS COLLEGE

Period	The day or days on which the class does not meet given in parentheses.		
I 8:30 to 9:25	Biology 13 (S.) Education 9 (T.) Education 11 (S.) English 1 French 1 (Th.) Latin 3		Mathematics 3 (T.) Mechanics 19 Philosophy 1 (S.) Pol. Science 3 (F.) Scandinavian 1 (T.) Sociology 5 (F.)
II 9:30 to 10:25	Biology 9 (T.) Biology 13 (S.) Chemistry 9 (W.) Education 5 (T.) English 15 (W.) German 3 (Th.) History 3 (W.)		Latin 5 Latin 13, 15 (Th.) Mathematics 1 (S.) Philosophy 3 (T) Polit. Science 1 (W.) Spanish 1 (W.)
III 10:30 to 11:25	Biology 1 Biology 13 (S.) Chemistry 3, 13 (S.) Education 1 (Th.) English 1 French 1 (S.) German 1 (Th.)		History 9 (W.) Mathematics 7 (T., Th., S.) Minerology 5 (Th.) Philosophy 5, 7 (T.) Polit. Science 9 (T., Th., S.) Polit. Science 7 (W., Th., F.) Sociology 3 (W.)
IV 11:30 to 12:25	Biology 15 Chemistry 3 English 5 (T., F.) French 7 (T., Th.) Geology 1 Geology 3 (W., Th.) German 5 Greek 5 History 7 Latin 7 (T.)	Convocation on Saturday.	Latin 9 (W. Th., F.) Latin 11 Mathematics 1 Nature Study & Agr. 19 Petrography 7 (T., F.) Physics 3 T., Th.) Physics 5 (Th.) Polit. Science 11 Sociology 1
V 1:30 to 2:25	Biology 7 (Th.) Biology 11 Chemistry 1 Education 3 English 19 (F., S.) French 3 (W., F.)		Greek 1 History 5 (W.) Physics 1 (Th.) Physics 7 (T., S.) Scandinavian 5 (Th.) Spanish 3 (T., Th., S)
VI 2:30 to 3:25	Biology 7 (Th.) Biology 11 Chemistry 3 (S.) Chemistry 5 (T., S.) Chemistry 7 (T.) Commerce 3, (Th.) Education 13 (W., F., S.) English 11 (T., S.) English 17 (Th.)		French 5 (Th., S.) Greek 7 (T.) History 1 (Th.) Mathematics 5 (W., F.) Mathematics 11 (T., Th., S.) Physics 1 (T., Th., F.) Physics 5, 7 (T., W., F., S.) Physics 11 (W., Th., S.) Scandinavian 3 (S.)
VII 3:30 to 4:25	Biology 3, 5 (W.) Chemistry 3 (S.) Chemistry 5 (T., S.) Chemistry 7 (T.) Commerce 1 (S.) ducation 7 (W., S.)		Greek 3 (S.) Latin 17 (S.) Physics 5, 7 (T., W., F., S.) Physics 11 (W., Th., S.) Sociology 7 (Th., S.)
VIII 4:30 to 5:25	Biology 3, 5 (W.) Biology 19 (W., Th., F., S.)		Chemistry 5 (T., S.) Physics 11 (W., Th., S.)

SECOND SEMESTER.

FOR COLLEGE OF LIBERAL ARTS AND TEACHERS COLLEGE

Period	The day or days on which the class does not meet given in parentheses.		
I 8:30 to 9:25	Biology 18 (S.) Education 10 (T.) Education 12 (S.) English 2 French 2 (Th.) Latin 4		Mathematics 4 (T.) Mechanics 20 Philosophy 2 (S.) Polit. Science 4 (F.) Scandinavian 2 T.) Sociology 6 (F.)
II 9:30 to 10:25	Biology 18 (S.) Chemistry 10 (W.) Education 16 (F.. S.) Education 18 (T., W., Th.) English 16 (W.) German 4 (Th.) History 4 (W.)		Latin 6 Latin 14, 16 (Th.) Mathematics 2 (S.) Philosophy 4 (T.) Polit. Science 2 (W.) Spanish 2 (W.)
III 10:30 to 11:25	Biology 2, 20 Biology 18 (S.) Chemistry 4 (S.) Education 2 (F., S.) English 2 French 2 (S.) German 2 (Th.)		Mathematics 8 (T., Th., S.) Mineralogy 6 (Th.) Philosophy 5, 7 (T.) Polit Science 10 (T., Th., S.) Polit. Science 8 (W., Th., F.) Sociology 4 (W.)
IV 11:30 to 12:25	Biology 16, 20 Chemistry 4 English 8 (Th.. F.) French 8 (T., Th.) Geology 2 Geology (W., Th.) German 6 Greek 6 History 8 Latin 8 (T.)	Convocation on Saturday.	Latin 10 (W., Th., F.) Latin 12 Mathematics 2 Nature Study & Agr. 20 Petrography 8 (T., F.) Physics 4 (T., Th.) Physics 6 (Th.) Polit. Science 12 Sociology 2
V 1:30 to 2:25	Biology 8 (Th.) Biology 10, 12 Chemistry 2 Education 4 English 20 (F., S.) French 4 (W., F.)		Greek 2 History 6 (W.) Physics 2 (Th.) Physics 8 (T., S.) Scandinavian 6 (Th.) Spanish 4 (T., Th., S.)
VI 2:30 to 3:25	Biology 8 (Th.) Biology 10, 12 Chemistry 4 (S.) Chemistry 6 (T., S.) Chemistry 8 (T.) Commerce 4 (Th.) Education 14 (W., F., S.) English 12 (T., S.) English 18 (Th.)		French 6 (Th., S.) Greek 8 (T.) History 2 (Th.) Mathematics 6 (W., F.) Mathematics 12 (T., Th., S.) Physics 2 (T., Th., F.) Physics 6, 8 (T., W., F., S.) Physics 12 (W., Th., S.) Scandinavian 4 (S.)
VII 3:30 to 4:25	Biology 4, 6 (W.) Chemistry 4 (S.) Chemistry 6 (T., S.) Chemistry 8 (T.) Commerce 2 (S.) Education 8 (W., S.)		Greek 4 (S.) Latin 18 (F.) Physics 6, 8 (T., W., F., S.) Physics 12 (W., Th., S.) Sociology 7, 8 (Th., S.)
VIII 4:30 to 5:25	Biology 4, 6 (W.) Chemistry 6 (T., S.)		Chemistry 12 (W.) Physics 12 (W., Th., S.)

THE COLLEGE OF MINING ENGINEERING.

FIRST YEAR.

	Tuesday	Wednesday	Thursday	Friday	Saturday
English I............	I	I	I	I	I
Chemistry I, General.	V	V	V	V	V
Mathematics I	....	II	II	II	II
Mechanical Drawing.	VI-VIII	VI-VII	VI-VII	VI-VII	....

SECOND YEAR

	Tuesday	Wednesday	Thursday	Friday	Saturday
Mathematics II	....	I	I	I	I
Surveying	....	....	....	....	....
Physics I.............	V	V-VI	....	V	V-VI
Chemistry II Analy'l.	III-IV or VI-VII	III-IV or VI-VII	III-IV VI-VII	III IV or VI-VIII	....
Geology I, General...	IV	IV	IV	IV	....

THIRD YEAR

	Tuesday	Wed'sday	Thursday	Friday	Saturday
Metallurgical Chem'y	VI VII VIII	....	VI VII VIII	VI VII VIII	....
Mechanics............	....	I	I	I	I
Experimental Engineering....	Mondays	Spring	Term		III
Mineralogy	III	III	III	....	....
Economic Geology ...	IV	....	....	IV	....
Descriptive Geometry	II	II	....	II	II

FOURTH YEAR

	Tuesday	Wed'sday	Thursday	Friday	Saturday
Assaying and Ore Treatment......	VI VII	VI VII	VI VII	VI VII	....
Physics II............	VI VII VIII	....	....	VI VII VIII	....
Mining Engineering.	IV	IV	IV	IV	....
Thesis	....	....	....	....	....
Surveying or Machine Design	....	....	....	....	....
An Elective...........	....	....	....	....	....

COLLEGE OF MECHANICAL AND ELECTRICAL ENGINEERING

Freshman Year.

Subject.	No. of Course.	Hrs. First Sem.	No. of Course,	Hrs. Sec'd Sem.
English	1	4	2	4
Mathematics	1	4	2	4
Chemistry	1	4	2	4
Mechanical Drawing	1	2	2	2
Shop Work (Foundry)	1	2	(Wood Working) 2	2

Sophomore Year.

Subject.	No. of Course.	Hrs. First Sem.	No. of Course.	Hrs. Sec'd Sem.
Mathematics	3	4	4	4
Physics	1	4	2	4
Descriptive Geom	1	2	2	2
Mechanical Drawing	3	2	4	2
Chemistry	3	4	..	..
Shop Work (Patt'n Mak'g)	3	2	(Forge Work) 4	2
English	..	..	8	2
Ele'ts. of Mach. Des'n	..	..	M. E. 2	2

Junior Year.

Subject.	No. of Course.	Hrs. First Sem.	No. of Course,	Hrs. Sec'd Sem,
Mechanics of Eng'g	M. E. 19	4	M. E, 20	4
Machine Design	M. E. 5	2	M. E. 6	2
Kinematics	M. E. 3	2	M. E. 4	2
Physics	11	4	..	..
Mechanical Laboratory	M. E, 11	2	M. E 12	2
Shop Work, Forge and Machine	5	2	(Machine Shop) 6	2
Dynamo Electric Mach'y	..	..	E. E. 2	4

Senior Year for M. E.

Subject.	No. of Course.	Hrs. First Sem.	No. of Course.	Hrs. Sec'd Sem.
Thermodynamics and Heat Eng's	M. E. 21	4	M. E. 22	4
Heating, Vent'g. Water Sup.	M. E. 23	2	..	..
Contracts, Spec'ns, Shop Man't	..	..	M. E. 24	2
*Machine Design	M. E. 7	2	M. E. 8	2
*Machine Design	M. E. 9	2	M. E. 10	2
Dynamo Electric Mach'y	E. E. 3	2	..	..
*Mechanical Laboratory	M. E. 15	2	M. E. 16	4
*Shop Work (Machine Shop)	7	2	8	2
Dynamo Laboratory	E. E. 7	2	..	..
Thesis	..	..	M. E. 30	2 to 8

Senior Year for E. E.

Subject.	No. of Course.	Hrs. First Sem.	No. of Course.	Hrs. Sec'd Sem.
Thermodynamics and Heat Engs.	M. E. 21	4	..	..
Boilers and Power Pl't Problems	..	..	M. E. 22	4
*Electrical Eng's and Design	E. E. 11	4	E. E. 12	4
*Electrical or Dynamo Lab	E. E. 9	4	E. E. 10	4
Mechanical Laboratory	M. E. 17	2	..	..
*Electrical Machine Design	..	..	E. E. 6	2
Alternating Currents	E. E. 5	2	..	..
*Shop Work (Machine Shop)	7	2	8	2
Thesis	..	..	E. E. 20	2 to 8

COURSE IN CIVIL ENGINEERING.

As the work of the first three years of a civil engineering course is embodied in the curriculums of the existing engineering colleges, the course of civil engineering is under the joint direction of the colleges of mechanical and mining engineering. The degree of civil engineer (C. E.) is conferred upon those who complete satisfactorily the following curriculum:

Freshmen Year.	First Semester. Hours	Second Semester. Hours
English, 1 and 2	4	4
Mathematics, 1 and 2	4	4
Chemistry, 1 and 2	4	4
Mechanical Drawing, 1 and 2	2	2
Mechanical Drawing, 5 and 6	2	1
Surveying, 2 a	..	1

Sophomore Year.	First Semester. Hours	Second Semester. Hours
Physics, 1 and 2	4	4
Mathematics, 3 and 4	4	4
Descriptive Geometry, 1 and 2	2	2
Surveying	..	4
Chemistry, 3	4	..
Mechanical Drawing, 3 and 4	2	2

Junior Year.	First Semester. Hours	Second Semester. Hours
Mechanics of Engineering, M. E. 19 and 20	4	4
Geology, 1 and 2	4	4
Experimental Engineering, M. E. 11 and 12	2	2
Machine Design	2	2
Design of Roof and Bridge Trusses, 1 and 2	2	2
Elements of Sanitary Engineering	2	..
Astronomy, Geodesy and Railway Surveying, Surveying 3	..	2

Senior Year.	First Semester. Hours	Second Semester. Hours
Masonry	4	4
Two of the following:		
Hydraulics, 4 hrs	4	4
Railway, 4 hrs		
Topograghy, 4 hrs		
Municipal Engineering and Water Supplies	4	4
Steam Engineering } or Physics 11 { Biology, } Electrical Engineering } and 12 or { Metallurgy }	4	4
Thesis	..	2 or more

COLLEGE OF LAW.

FIRST YEAR.

Contracts. Williston's Cases on Contracts. One hundred hours.

Criminal Law and Procedure. Selected Cases on Criminal Law and Procedure, and the Criminal Code of North Dakota. Seventy hours.

Real Property. Bronson's Analysis, Notes and Cases on Real Property. Seventy hours.

Torts. Ames's Cases on Torts and Smith's Cases on Torts. Seventy hours.

Civil Procedure. Lectures and Selected Cases. Thirty hours.

Agency. Huffcut's Cases on Agency. Fifty hours.

Sales. Burdick's Cases on Sales. Fifty hours.

Bailments. Selected Cases. Twenty hours.

Moot and Practice Court. Forty hours.

SECOND YEAR.

Private Corporations. Smith's Cases on Private Corporations, Seventy hours.

Equity. Selected Cases. Fifty hours.

Evidence. Thayer's Cases on Evidence. Seventy hours.

Carriers. McClain's Cases on Carriers. Forty hours.

Bills and Notes. Huffcut's Cases and the Negotiable Instruments of Law. Forty hours.

Conflict of Laws. Beale's Cases. Forty hours.

Damages. Beale's Cases on Damages. Twenty Hours.

Partnership. Mechem's Cases on Partnership. Twenty-five hours.

Wills and Administration. Chaplin on Wills. Twenty-five hours.

Code Pleading and Practice. Bliss on Code Pleading. Thirty-five hours.

Constitutional Law. McLain's Cases. Forty hours.

Municipal Corporations. Selected Cases. Twenty hours.

Moot Court. Eighty hours.

COLLEGE OF MEDICINE.*

FIRST YEAR.

First Semester—

English 1.
Chemistry 1.
Modern Language 1.
Physics 7.

Second Semester—

English 2
Chemistry 2.
Modern Language 2.
Physics 8.

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*Prepares students for the junior year in our best medical colleges.

SECOND YEAR.

First Semester—

- Biology 7.
- Chemistry 3.
- Modern Language 3.
- Psychology 1.

Second Semester—

- Biology 8.
- Comparative Anatomy 20.
- Modern Language 4.
- Sociology 8.

THIRD YEAR—FIRST YEAR, MEDICAL COURSE.

First Semester—

- Anatomy.
- Chemistry 13.
- Histology.

Second Semester—

- Anatomy.
- Chemistry 14.
- Embryology.
- Physiology.

FOURTH YEAR—SECOND YEAR, MEDICAL COURSE.

First Semester—

- Anatomy.
- Bacteriology.
- Pharmacology.
- Physiology.
- Special Lectures.

Second Semester—

- Anatomy.
- Pathology.
- Hygiene.
- Physical Diagnosis.
- Prep. Surgery.
- Special Lectures.

THE MODEL SCHOOL.

	GENERAL CURRICULUM.				COMMERCIAL CURRICULUM.
YEAR.	REQUIRED	ELECTIVE			REQUIRED AND ELECTIVE.
I	English I El. Algebra	German I Latin I *Physiology 1st Sem. *Eng. History 2nd Sem.	Com'l Arith. 1st Sem. Com'l Geog. 2nd Sem. Penmanship and Spelling ½	Drawing ½ Man'l Trai'g ½ Music ¼ Phys. Training ¼	Comm'l English ½ Penmanship and Spelling ½ Com'l Geog. 1st Sem. Com'l Arith. 2nd Sem. Algebra An elective
II	English II Genl. History Pl. Geometry	German II Latin II Botany Physiography Agriculture 2nd Sem.	Bookkeeping I	Drawing ½ Manual Train'g ½ Music ¼ Phys. Train'g ¼	English II Bookkeeping I Two electives
III	English III	German I Latin I or III Chemistry	Bookkeeping II Stenography I Typewriting ½ Adv'd Algebra 1st Sem. Solid Geom. 2nd Sem.	Drawing ½ Manual Train'g ½ Music ¼ Phys. Train'g ¼	English III **Bookkeeping II **Stenography I Typewriting I, ½
IV	Physics *U. S. History 1st Sem. Civics 2nd Sem.	English IV German II Latin II or IV Pedagogy	Polit Econ. 1st Sem. Com'l Law 2nd Sem. Stenogr. ½ *Senior Arith. 1st Sem. *Senior Gram. 2nd Sem.	Drawing ½ Manual Train'g ½ Music ¼ Phys. Train'g ¼	**Stenography II **Typewriting II, ½ *U. S. History 1st Sem. Civics 2nd Sem. Polit Economy 1st Sem. Com'l Law 2nd Sem. An elective, ½

*Advanced U. S. History, English History, Physiology, Senior Arithmetic and Senior Grammar are not given in the year 1908-9. **See note 4 below.

REPORT OF THE DEAN OF THE COLLEGE OF LIBERAL ARTS

University, N. D., Oct. 15, 1908.

To the President of the University:

SIR: I have the honor to submit the following report of the College of Liberal Arts for the biennial period ending June 30, 1908:

ENROLLMENT.

Though the growth of this, the oldest college of the University, has not been during the past two years proportionately as great as that of some of the newer colleges, still it has been very encouraging. The enrollment for 1907-1908 was 17 per cent greater than that for 1905-1906, the last year covered by the last biennial report. Graduates of nineteen of the high schools of the state were enrolled in 1906-1907; of twenty-four in 1907-1908. Of the undergraduates enrolled during these two years about 27 per cent received their preparation, in whole or in part, in the preparatory department of the University.

INSTRUCTION.

The courses of study pursued by under graduate students during the year 1906-1907 were as follows:

Biology—

1. General botany.
2. Plant physiology; general morphology of algae, fungi and bryophytes.
3. General morphology of pteridophytes, gymnosperms and angiosperms.
5. Protoplasm, cells and tissues; invertebrate and vertebrate zoology.

Chemistry—

1. General chemistry.
2. Qualitative and quantitative analysis.
3. Organic and analytical chemistry.
4. Metallurgical chemistry.

Education—

3. History of education, educational classics, and child study.
4. The art of study, educational psychology, and text books.
7. Grade management and problems.

English—

1. Advanced rhetoric and studies in literary form and interpretation.
3. The rise of romanticism, the romantic poets, and Victorian literature.
4. The beginning and development of literature in America; the greater poets and prose writers; recent and contemporary American literature.
5. Public speaking.
6. Journalism.
7. The Elizabethan drama.

French—

1. Grammar and reader; translation of easy authors; composition and conversation.
2. Study of the subjunctive mood; Mlle de la Seigliere, Le Bourgeois Gentilhomme and Athalie as perpared class work, with as much reading at sight as possible; composition and conversation.
3. L'Avare, Le Monde ou l'on s'ennuie and Harnani; extracts from Montaigne and Joinville in connection with lectures on the development of the French language and literature; sight reading, composition and conversation.

Geology—

1. General geology.

German—

1. Grammar and reader; sight reading, composition and conversation.
2. Keller's Second Year in German, Der Neffe, als Onkel, Minna von Barnhelm and Wilhelm Tell; sight reading, composition and conversation.
3. Selections from Heine, Faust, Part 1, and Gore's German Science Reader; Koch's Deutsche Literaturgescichte and lectures on the history of German literature; composition and conversation.

Greek—

1. First lessons, composition and Book I of Xenophon's Anabasis.
2. Xenophon's Anabasis, books II, III and IV; Homer's Odyssey; composition.
3. Lysias (selected orations), Plato's Apology, Sophocles' Antigone, Mahaffy's Old Greek Life and Jebb's Primer of Greek Literature.

History—

2. Ancient, English and United States history; a lecture course designed especially to prepare teachers for work in the high schools of the state.
3. Mediaeval and modern history; history of the nineteenth century.
4. History of England and the United States.
5. Seminary in United States history—the Jacksonian epoch.
6. Seminary in history of the Northwest.

Latin—

3. Cicero's orations; composition.
4. Vergil's Aeneid; composition.
5. Cicero De Senectute, Livy, and Terence; composition.
6. Horace's Odes, Satires and Epistles; selections from the elegiac poets; the private life of the Romans; history of Roman literature.

Mathematics—

1. Higher algebra; trigonometry; analytic geometry.
2. Analytic geometry; differential and integral calculus.
3. Surveying.
4. Projective geometry.

Mechanical Engineering—

1. Mechanical drawing and shop work.
2. Descriptive geometry.

Mineralogy—

1. Descriptive mineralogy and blowpipe analysis.

Philosophy—

1. Logic, psychology and ethics.
2. A study of ancient and mediaeval philosophy, with a constant comparison of its views with those of today.

Physics—

1. Mechanics, heat, electricity, magnetism, sound, and light.
2. Electricity and magnetism with advanced laboratory work in electrical measurements; applied electricity.

Political and Social Science—

1. Elements of economics, advanced economics, money and banking.
2. Social problems; industrial combinations; municipal problems.
4. Comparative politics and constitutional law.
5. Civics.
6. Finance and taxation.

Scandinavian—

1. Grammar and reader; Bjornson's Englad Gut; Lie's Den Fremsyste; composition and conversation.

2. Hofgaard's Norsk Grammatik; Aar's Retskrivningsregler; Broch and Seip's Laesebog i Modersmaalelt for Middelskolens hoiere Klasser; Petersen's Norge Historie; selected outside reading.

3. Broch and Seip's Literatur-historie; Ibsen's Peer Gynt; Tegner's Frithjofs Sage (in Swedish); selected outside reading to be reported on in class; lectures on the Scandinavian languages and literatures.

Spanish—

1. Grammar and reader; composition and conversation.

The following list includes the courses pursued in 1907-1908:

Biology—

1. General botany.
2. Plant physiology.
3. Plant morphology.
7. Studies in cell structure and in the morphology of the principal plant groups.
8. General zoology.
11. Histology.

Chemistry—

1. General chemistry.
2. Qualitative and quantitative analysis.
3. Organic chemistry, urinary analysis, and toxicology.
5. Assaying and ore treatment.

Education—

3. History of education and child study.
5. School supervision and administration.

English—

1. Advanced rhetoric and studies in literary form and interpretation.

2. Old and middle English and methods of teaching English.

3. The rise of romanticism; the romantic poets; Victorian literature.

4. The beginnings and development of literature in America; the greater American poets and prose writers; recent and contemporary American literature.

5. Public speaking.

6. Journalism.

7. Shakespeare and the development of the English drama.

French—

1. Grammar and reader; translation of easy authors; composition and conversation.

2. Study of the subjunctive mood; Mlle de la Seigliere, Le Bourgeois Gentilhomme and Athalie, as prepared class work with as much reading at sight as possible; composition and conversation.

3. L'Avare, Le Monde ou l'on s'ennuie and Hernani; extracts from Montaigne and Joinville in connection with lectures on the development of the French language and literature; sight reading, composition and conversation.

Geology—

1. General geology.
3. Economic geology.

German—

1. Grammar and reader; translation of easy authors; composition and conversation.

2. Die Journalisten, Minna von Barnhelm and Welhelm Tell; composition and conversation.

3. Faust, part I; Kron's German Daily Life; Prehn's Journalistic German; Moore's History of German literature; sight reading, composition and conversation.

Greek—

1. First lessons, part of Book I of Xenophon's Anabasis, and composition.

2. Xenophon's Anabasis, books I, II, III, with a review of Attic forms and special study of syntax; Homer's Iliad, with assigned readings on the history of early Greek poetry, the Homeric question and Homeric antiquities; prose composition.

3. Lysias (selected orations), with a study of the Athenian courts and the development of oratory; Plato's Apology and Crito, with a brief survey of Greek philosophy from Thales to Aristotle; Sophocles' Antigone, with an introductory study of Greek tragedy; Mahaffy's Old Greek Life.

History—

1. History of England and the United States.

2. Ancient, English and United States history. A lecture course to prepare teachers for work in the high schools of the state.

3. Mediaeval and modern European history.

5. The most important phases of the economic and social development of the American people to 1825. The rise and decline of political parties to 1832.

6. Seminary in history of the Northwest.

Latin—

1. Cicero's orations; composition.
2. Vergil's Aeneid; composition.
3. Cicero De Senectute, Livy and Terence; composition.

Mathematics—

1. Higher algebra, trigonometry and analytic geometry.
2. Analytic geometry; differential and integral calculus.
3. Surveying.
4. Projective geometry.

Mechanical Engineering—

1. Mechanical drawing and shop work.
2. Descriptive geometry.

Mineralogy—

1. Descriptive mineralogy and blowpipe analysis.

Nature Study—

1. Nature study and agriculture.

Philosophy—

1. Psychology, logic and ethics.

Physics—

1. Mechanics, heat, electricity, sound and light.
5. General physics.
7. The teaching of physics.

Political Science—

1. Principals of economics; money and banking.
2. Social problems; industrial combinations; municipal problems.
3. Industrial history; tariff history of the United States; transportation.
5. Comparative politics; constitutional law.
6. Civics.
7. Public finance.

Scandinavian—

1. Grammar and reader; Bjornson's Synnoeve Slobakken; composition and conversation.

2. Hofgaard's Norsk Grammatik; Aar's Retskrivningsregler; Raabe's Laere og Laesebog i Norges og Nordens Historie; selections from Prestgard's Norsk Kvad; composition and conversation.

3. Two of Holberg's and one of Ibsen's dramas assigned as prepared class work. Selected outside reading to be reported on in class; Broch and Seip's Literatur-historie; lectures on the Scandinavian languages and literatures; composition and conversation.

Sociology—

1. Anthropology, ethnology and sociology.

Spanish—

1. Grammar and composition; rapid reading of easy prose and verse; colloquial Spanish; commercial correspondence.

To prevent any misunderstanding, I should state that the above lists do not include all the courses of study given in the University in the years named, but only such as were pursued by the undergraduates in the college of liberal arts.

I should add also that five of the members of the graduating class of 1906-1907 and six of the class of 1907-1908 elected their studies in the college of law.

REQUIREMENTS FOR ADMISSION.

The requirements for admission have been gradually raised until in its requirements for admission as well as in its requirements for graduation the University can justly claim to rank with the best institutions of our land. To be admitted without conditions, an applicant must show that he has completed satisfactorily *fifteen* units of high school or preparatory work, a unit being a course of study pursued throughout a school year of not less than thirty-six weeks, with five recitations a week of at least forty minutes each. In estimating units two periods of laboratory or shop work count as one of recitation. Of the fifteen units required the following *nine* are prescribed:

1. English, 3 units.
2. Algebra (through quadratics), 1 unit.
3. Plane geometry, 1 unit.
4. History (ancient or general), 1 unit.
5. Physics, 1 unit.
6. Foreign language, 2 units.

The remaining six units may be offered from a wide range of elective subjects.

NEW DEPARTMENTS.

On the recommendation of the president and the council, the trustees voted in the spring of 1907 to divide the department of Latin and Greek and that of political and social science and to establish the departments of Greek and sociology. Gottfried E. Hult, M. A., was chosen head of the department of Greek, and John M. Gillette, Ph. D., head of that of sociology. These departments were in successful operation under their new heads during the year 1907-1908.

COURSE IN COMMERCE.

This course was established in 1907 with the purpose of giving to those who, after leaving the University, go into general business, banking, insurance, journalism or the United States civil service, somewhat the same definite assistance in the way of special training for their life work that the University gives to those who are to be engineers. lawyers or doctors. At the same time, it aims to furnish the cultural training belonging to a liberal education.

The course is as follows:

Freshman Year. English; modern language; history; science.

Sophomore Year.—Commercial geography; political science; modern languages; public speaking or English.

Junior Year.—Modern language; law: contracts, agency, sales; sixteen hours elective.

Senior Year.—Modern business methods and accounting; law: corporations, carriers, bills and notes, partnership; sixteen hours elective.

The student is required at the beginning of his junior year to make known to the dean the business for which he wishes to make special preparation and must, under advice, select such courses of study as are best suited to his purpose.

The successful completion of the curriculum outlined entitles the student to the degree of bachelor of arts.

MASTER OF ARTS.

During the fall of 1906 the faculty, after careful consideration, voted to make the degree of master of arts a specialist's degree and adopted the following regulations governing its award:

A bachelor of arts of this University or a graduate of another institution who possesses similar attainments may, upon written application to the committee on graduate instruction, be admitted as a candidate for the degree.

Upon an accepted candidate the degree is conferred when he has completed a program of study approved by the committee on graduate instruction, passed examination with credit on same, and submitted a satisfactory thesis.

The program of study required of each candidate is equivalent to sixteen hours a week for one academic year. It consists of one major and two minor subjects, not more than two of which may be under the same instructor. The minor subjects must, as far as possible, be closely related to the major. The work in the major subject, to which approximately as much time should be given as to that in the two minors, must be work designed primarily for graduates, while the work in the minors must be work of a similar character, or courses for advanced undergraduates. In other words, all the work accepted for the degree must be of an advanced character.

The major subject must, in every case, be taken in the college of liberal arts or the teachers college, but one or both minors may, with the consent of the committee on graduate instruction, be chosen from courses offered in the professional colleges, subject always to the condition that they be related to, and tend to supplement, the major. But the same courses may not be offered both for the degree of master of arts and a professional degree.

A candidate whose program of study has received the approval of the committee on graduate instruction, pursues his work under the direction of a special committee consisting of the instructors in charge of his courses of study, the instructor in charge of his major subject being chairman. This committee has charge of his examinations and passes upon his thesis.

The candidate's thesis must be in connection with his major subject, and may form such part of that major as the instructor may determine. The subject of the thesis must be chosen and made known in writing to the chairman of the committee on graduate instruction not later than the end of the first week in December of the academic year in which the candidate expects his degree, and the thesis in its completed form must be submitted to the chairman of the special committee by May 15 of the same academic year. A bound, printed or typewritten, copy of the thesis, with the special committee's certificate of approval, must be deposited in the University library.

Graduates of other institutions must do one full year's work in residence. If, at the end of a year, they have not completed all of their work, they may do the remainder *in absentia.*

Graduates of this University may do their work in residence or *in absentia,* but those who do their work *in absentia* may not obtain their degree in less than two years from the date of their acceptance as candidates. Candidates *in absentia* must enroll each year (by correspondence, if necessary) with the registrar. They must pay once the same fees as candidates in residence, which are the same as for undergraduates.

The diploma fee for the degree of master of arts is the same as for that of bachelor of arts.

NEEDS.

It is universally held by those whose opinion is entitled to weight that any institution worthy of being called a university must undertake to extend the bounds of knowledge and must, therefore, make provision for the prosecution of original investigation and research. To do this in such a way as to encourage us to hope for any measure of success, we need, first, to increase the teaching force in most, if not all, of our departments, that our present instructors may be relieved of some of the class work they are now compelled to carry, and, secondly, to add materially to our library and laboratory equipment. I would urge, therefore, that an appropriation as large as possible be made for these purposes.

Respectfully submitted,

GEO. S. THOMAS,
Dean of the College of Liberal Arts.

REPORT OF THE DEAN OF TEACHERS COLLEGE

University, N. D., Nov. 5, 1908.

To the President of the University:

My Dear Sir: I beg leave to submit the following report of teachers college for the biennial period ending June 30, 1908.

TEACHERS COLLEGE FACULTY.

At present the professional work in teachers college is done by the professors in education and by the heads of many of the other departments, who offer special courses to teachers. In much of the academic work the students in teachers college avail themselves, like the students of the other professianl or technical colleges, of the courses offered by the regular University professors, who are the instructors of all who wish to attend their classes or lectures.

I would recommend, as the classes grow larger and larger necessitating division, that instead of employing assistants and instructors under one head in a department, professors of co-ordinate rank, specially identified with teachers college, be employed by the University. It is only thus that an *esprit de corps,* a professional spirit and atmosphere, can be generated to the best advantage.

HISTORY AND AIM OF TEACHERS COLLEGE.

A normal college, or department, was established by charter at the founding of the University in 1883. The curriculum of this department, up to 1905, included, academically and professionally, the equivalent of a high school course and the first two years of college work. Its primary aim was the preparation of teachers for the elementary schools and for the smaller graded and high schools of the state.

In 1905 the board of trustees established teachers college, thus extending the previous course to full college rank. The aim of teachers college is to be a professional school for the education of teachers and leaders of educational thought. Its aim is specifically and primarily to prepare men and women as teachers of special subjects in high schools, as principals of graded and high schools, as superintendents of schools, as teachers and supervisors of special subjects, and as instructors in educational institutions.

REQUIREMENTS FOR ENTRANCE TO TEACHERS COLLEGE.

As in the case of entrance to the colleges of liberal arts, engineering and medicine, the completion of a four-year high school course is now necessary for entrance to teachers college.

ADVANCED STANDING.

Students who have done college work elsewhere may receive credit for it either on examination or on presentation of acceptable credentials. Heads of departments at the University accord such credit to those credentials, in their respective fields, as they deem just; no such student, however, will be granted the bachelor's degree or a diploma without at least one year's work in residence.

TEACHERS COLLEGE CURRICULUM.

1. *Required work of college grade:—*

Education: 23 credits, including four hours in the history and four hours in the philosophy of education for all; and six semester hours in school supervision and administration for those preparing for administrative posions; other courses elective. The professional part of special group subjects may also be included.

English: 1 and 2.
Psychology, general or educational: four hours.
Logic or ethics: four hours.
Natural science: eight hours.
Some one foreign language: fourteen hours.
Physical culture: two hours.

2. *Electives:—*

A sufficient amount of elective work to give a total of 124 credits is necessary to secure the degree of bachelor of arts and the bachelor's diploma in education.

3. *Special Preparation:—*

It is necessary for prospective teachers or superintendents to elect their courses in view of the position for which they are preparing. They make known to the dean their lines of special preparation as soon as possible.

Each candidate for graduation prepares specially on from one to three subjects, or lines of work, and these are written, and certified in his bachelor's diploma (the professional instrument) at graduation. The following are the minimum requirements in the several special subjects available.

(1) Biology: sixteen hours in addition to eight hours of chemistry.

(2) Chemistry: sixteen hours.

(3) Commercial subjects: eight hours in addition to the three year-courses offered at entrance or taken in the model school.
(4) English: twenty-four hours.
(5) Geology: eight hours in addition to eight hours of chemistry and the physiography taken in high schools.
(6) History: sixteen hours.
(8) Mathematic: eight hours, in addition to the higher algebra and solid geometry taken in high schools.
(7) Latin: sixteen hours above Vergil.
(9) Modern languages: twenty-four hours in each.
(10) Physics: eight hours in addition to eight hours of chemistry.
(11) Political science: eight hours in addition to the year course taken in high schools.

NOTE.—In addition to the academic requirement for each group, a teachers' course covering the theory and practice of teaching the subject must be taken when required by the department concerned.

BACHELOR OF ARTS AND BACHELOR'S DIPLOMA.

When a student has completed the curriculum of teachers college, (124) credits), which ordinarily takes four years but which can be completed sooner by very good students, he will be entitled to the degree of bachelor of arts (B. A.) and to the bachelor's diploma in education. This last is valid as a state certificate of the second class for three years. After one year's experience such person is entitled to the state certificate of the first class, valid for five years; and after sixteen months' experience he may secure the professional certificate valid for life.

THE MASTER'S DEGREE.

Any person having the degree of bachelor of arts (B. A.) from the University or any other institution of like standing, may, upon written application, become a candidate for the degree of master of arts. The master's degree is, historically and at present actually, the teacher's degree—*Magister* (teacher) *Artium*. Those who seek it have everywhere and in almost all cases *teaching* in view. The candidate may take his majors or minors in education.

It involves a year's work, in residence, on a major subject with its thesis, and two minors. The applicant, if the holder of the B. A. degree from this University may be permitted to do this work *in absentia,* in which case two years at least will be required.

SPECIAL STUDIES AND CERTIFICATES.

Persons of earnest purpose who have completed the entrance requirements or their equivalent but who can not spend the time necessary for a degree are admitted freely into existing classes for which they are prepared. Such persons may qualify for special lines of teaching; and provided they have done not less than two years' work, or sixty-two credits, including the specific requirements, will be given special certificates valid in law as state teachers' certificates. For the present, opportunity is offered in the following lines:

(1) Preparation for teaching in the common and smaller high schools. In order to qualify for this purpose and to secure the teachers' diploma the student must take in teachers college a semester in the history of education, one in general or educational psychology, two in special methods, seven hours of elective work in education, eight hours in English, and eight hours in history; the balance of the sixty-two credits are elective. If a student has had for entrance a year of pedagogy (psychology and school management) or of the senior common branches, only one semester of special methods is required.

(2) Preparation for teaching the commercial subjects in high schools. For this purpose and to secure the special certificate of qualification, it is necessary to have for entrance, book-keeping, commercial law and two years of shorthand and typewriting; and to take in teachers college the courses in modern business methods and accounting and in commercial geography; also eight semester hours in English, eight in political science and sixteen in education. The balance of the sixty-two credits are elective. An excellent opportunity is offered in teachers college to prepare for filling the many demands for teachers of commercial subjects in the high schools of the state.

(3) Preparation for the teaching of music and drawing. The demand for special teachers in these lines is increasing, and teachers college is making provision for such instruction and equipment as will adequately meet it. Special appropriate certificates will be granted on the completion of the two-year course.

OBSERVATION AND PRACTICE.

With the transformation of the preparatory department into a model school for teachers college, in charge of the department of education, opportunity will be afforded for observation and practice, to members of the senior class.

THE MODEL SCHOOL.

The old preparatory department has been partially transformed into what is by courtesy and by prospect called a "model" school. But we have done all that our room and equipment would warrant. it is our hope to be enabled by the new building which we ask, to make it a *model* in every respect. The commercial department has become *in toto* a department of the model school, as far as its elementary courses are concerned. Mr. W. M. Bryant, the former efficient principal of the commercial department remains in charge of the work. He also gives advanced courses in commercial work to those preparing to fit themselves as commercial instructors in high schools. The English of the old preparatory department has also been transferred *in toto* to the model school and is in charge of Miss Christine Boyson who comes to us amply equipped in her line from teachers college, Columbia.

The music and drawing are also provided for in the model high school and in teachers college, and are in charge of Miss Gola F. Baker, who comes well equipped from the best music and art schools of the east.

The balance of the old preparatory curriculum is, through necessity, carried by the different department of the University. This work will be assumed by the model school as soon as room, teaching force and other facilities are provided.

It is intended that such a model school will in no sense be a competitor of any high school in the state. The student body will, no doubt, as in the preparatory department, continue to be made up of young men and women of maturity who would not attend regular high schools with children three or four years younger, or who have no high school advantages in the small towns and rural districts. The number could be advantageously limited. The school will be the place of observation of good high school teaching and for the study of secondary school problems, and will give the opportunity to the seniors in teachers college of receiving some experience in actual teaching under proper supervision.

I incorporate, following, two letters of Professor C. C. Schmidt, superintendent of the model school and professor of school supervision and administration in teachers college, on the "Preparation of teachers for secondary schools' and "Model schools at universities." They cover well the history, needs and present attempts throughout the country, on the part of higher institutions of learning, to provide trained teachers for high schools.

PREPARATION OF TEACHERS FOR SECONDARY SCHOOLS.

BY PROFESSOR C. C. SCHMIDT.

Ever since the establishment of secondary schools the universities and colleges have supplied them with the majority of their teachers. The academies of the east secured their teachers from Harvard and Yale and other colleges, the teachers of the German gymnasia have always been trained in the great universities, and Oxford and Cambridge have supplied the masters for the great English secondary schools. This practice has been of the utmost importance to the young people in the schools under consideration. The liberal attitude that can overlook the petty shortcomings of adolescents, the breadth of view so easily communicated to the semi-visionary youth of that age, and withal thorough scholarship,—these are the great essentials to the inspiring teacher of a secondary school, and they can best be gotten from college life.

To be sure, in this country the young teachers who thus came to the secondary schools have often been sadly deficient in pedagogical knowledge, but the qualifications to which I have alluded are of greater consequence than the highly developed arts of the mere drill master. Nevertheless, ever since the normal schools all over the country have demonstrated the effectiveness of professional training for the elementary school teacher, the conviction has grown among high school experts that a certain amount of pedagogical work would not detract in the least from the value of the college course and would be helpful in starting the young teacher with a reasonable measure of professional insight. School authorities and patrons kept insisting that all teachers should have some professional training before entering the school room and not get it solely by experimenting upon the pupils. The colleges have at last begun to respond to the public desire and the opportunities that they have offered have been seized with phenomenal eagerness. This introduction of education as a subject for study and investigation in colleges was accomplished within our memory, yet so rapid has been the growth of the intruder that, according to the report of the United States Commissioner of education, during the academic year 1904-5, 240 colleges and universities report students in courses intended for the professional training of teachers. Where less than thirty years ago there was not a single university chair given over completely to the subject of the theory and practice of education, in 1904-5, 148 institutions reported administrative provision for professors of pedagogy or heads of departments of education. Or, again, not taking the forty-four technological colleges into the account, there were 575 institutions nominally described as universities and colleges, 240 of which, as stated, or nearly forty-two per cent. of them, offered courses in education. These 575 institutions enrolled 87,591 students in the liberal arts courses, and 11,977 in one or more courses in education. Assuming that the students of pedagogy are also counted as liberal arts students, this means that more than an eighth of all the liberal arts students in the 575 institutions are taking pedagogy, although only forty-two per cent. of those institutions are offering this subject.

The Columbia University Quarterly for June, 1907, gives a table showing the enrollment in fourteen of the largest universities where courses in education are offered. This shows an enrollment of 17,952 liberal arts students of whom 3,297 or about one-fifth, were pursuing courses in education. In Columbia college 865 of the 1,470 liberal arts students, or nearly three-fifths of them, were taking courses in education. Of graduate students the teachers college has for several years had a larger number than any other department of the university has had.

As the preparation of secondary school teachers has been the most conspicuous business of a college of liberal arts it may not be long before half the students enrolled in such colleges throughout the country will devote a reasonable portion of their attention to the study of professional courses in education. It is needless to add that these courses will be mainly such as are specially adapted to meet the needs of prospective high school teachers and school superintendents.

So much for a general statement. Now, more specifically, what is the character of the professional training that is at present offered, and what further adjustment should be demanded of the colleges to meet the needs of the situation?

The best authority upon this question of which I know is the "Recommendations of the committee of seventeen on the professional preparation of high school teachers.' This committee was appointed in 1905 by the department of secondary education of the national educational association, and its membership, which is scattered over all parts of the country, represents high schools, normal schools, colleges and city superintendents. This committee recommends "that the minimum requirement for a secondary school teacher shall be graduation from a college maintaining a four-year course and requiring four years' high school work for admission." A year''s graduate work is considered desirable but is not insisted upon.

The academic preparation of the prospective high school teacher is to include the following elements:

"A. A detailed and specialized study of the subjects to be taught and work outside of those sufficient to give some insight into the different fields of knowledge and to avoid the dangers of over-specialization.

"B. One or more subjects from a group including history, economics and sociology, which will give the teacher a proper outlook upon the social aspects of education.

"C. A course in general psychology, and at least one from a group of subjects including history of philosophy, logic, and ethics, which will give the teacher a proper outlook upon education as the development of the individual."

To give professional preparation it is recommended that at least one-eighth of the college course be devoted to the following subjects: History of general education and secondary education; educational psychology with emphasis on adolescence; the principles of education including the study of educational aims, values and processes; special methods in the secondary school subjects that the student expects to teach; and lastly, school hygiene. These subjects are studied in separate courses or "in such combinations as convenience or necessity demands," and "the proportionate amount of time given to them may vary with local conditions."

In addition to the preceding a separate recommendation stipulates that "opportunity for observation and practice teaching with secondary pupils shall be given."

These recommendations embody the best expert opinion regarding the preparation of teachers for secondary schools, and are in harmony with the adjustment that is being made by the colleges. A few universities, such as Columbia and Chicago, now have their teachers colleges that are as nearly ideal as money can make them. A few others have an equipment that may be considered fair, while several hundred are still in processs of adjustment and are at present meeting the needs only in part. It is entirely probable that this evolution will go forward at a marvelous rate during the next ten years, and will prove to be the most striking movement among American colleges and universities in the present generation.

The pedagogical work that is offered in the colleges referred to usually includes courses in general and educational psychology, and the history and the principles of education. The colleges that have gone beyond the most meagre provisions also offer a variety of other subjects, as for example, Teachers College of the University of North Dakota, adds to the above list courses in theory and practice in the special subjects which the student expects to teach, the study of educational systems, school supervision and administration observation of teaching processes, high school management, child study, adolescence, nature study, and a critical examination of text books. The three men in the department of education devote practically all their time to this work and courses in special methods are also given in the other departments of the university. Some of the larger teachers colleges employ a much large teaching staff, but many institutions offer only such courses as can be given by one man, and still others attach the work in pedagogy to other chairs so that one man may be professor of philosophy. psychology, logic, ethics, history of education, and general and special methods in all the elementary and secondary studies. It is needless to say that such provision is entirely inadquate; the work cannot be done well where one man is required to cover such an array of subjects.

Under a separate caption we shall consider the last phase of work that the committee of seventeen insists upon for the preparation of high school teachers,—namely, observation and practice teaching with secondary pupils. A model school for the purpose is now the most pressing nead of teachers college and it is hoped that the state of North Dakota may soon provide the necessary building, and thus enable its University to keep abreast with the progressive institutions of its class.

MODEL SCHOOLS AT UNIVERSITIES.

BY PROFESSOR C. C. SCHMIDT.

Courses in the observation of teaching processes and in practice teaching under criticism could easily claim to be the most practical of all the professional courses that can be offered for the training of teachers. They correspond to the medical student's hospital practice. Upon this proposition nearly all competent critics are agreed. Both to provide facilities for these lines of work is a more perplexing problem than that presented in the organization of any other course in education. The following ways for meeting the demand may be named:

I. To provide a special school for observation and practice (a model school). This is expensive and sometimes there are other difficulties to be met.

II. To utilize the public schools of the vicinity. Here every step of the way is paved with difficulties. (1.) It is rare that all the teachers of the schools are in harmony with the pedagogical theories expounded by the department of education in the university. (2.) A student is obliged to lose much time in trying to find the period for the class work which he wishes to observe. (3.) When practice work is attempted a far more critical factor must be confronted. The teachers, pupils and patrons are apt to develop prejudices against cadet teaching that spell failure. The arrangement can never succeed unless the best of feeling exists normally between city school authorities and the university, and the thing is managed with great tact on both sides. In most places it would be simply impossible to make it work.

We shall proceed to an examination of both of these systems, and shall begin with *the model schools.*

Pre-eminent among the institutions of the country in the professional education of teachers is Teachers College of Columbia University; and the facilities provided for observation, practice and experiment are on the same generous and comprehensive scale as those for all other departments. "From the first, side by side with the college classes of Teachers College, there have been classes of children under instruction to afford opportunity for observation and practice teaching." These classes exist now in the form of two complete schools, which are an organic part of Teachers College and are under its own exclusive control. They are the Horace Mann School and the Speyer School.

The Horace Mann School enrolled 1054 pupils last year, and had a teaching staff of eighty-two persons, of over fifty men and thirty women. It comprehends a complete school system with two kindergartens, seven elementary grades, and a five-year high school course. The tuition is now $75.00 in the kindergarten, $150.00 in the primary grades, $200.00 in the grammar grades, and $250.00 in the high school.

The school is under the direction of a superintendent who is also professor of school administration on the Teachers College faculty. "Vital connection with Teachers College is further affected by the supervisory relationship of the professors of Teachers College, by which each professor becomes an advisor regarding the teaching of his subject in the Horace Mann schools." On account of the high tuition charged the student teachers do not practice teaching in the Horace Mann school. It is distinctly "a school of observation" for Teachers College, and is "an example of a school under the best conditions obtainable in educational practice," and as such it is studied not only by the student of Teachers College but is visited annually by a large number of teachers and superintendents from American schools and those of foreign countries.

The Speyer school, with an attendance of 343 pupils is the school of practice and experiment, and furnishes the student teachers the needed opportunity for this line of training. It includes a kindergarten and eight elementary grades, and is housed in a commodious five-story building, which besides the necessary class rooms and offices contains two library rooms, a gymnasium with shower baths, a woodworking shop, a school kitchen, dining room ,sewing room. and four club rooms.

We have described the two model schools of the Teachers College of Columbia University somewhat fully because they furnish the most highly developed example of schools of this type. Other model schools are maintained by the Chicago University School of Education, by the University of Missouri, the University of Minnesota, the Ohio University Normal college and the University of Wyoming.

OBSERVATION AND PRACTICE IN THE HIGH SCHOOLS. ACADEMIES AND NORMAL SCHOOLS.

It is said that "perhaps no university with the department organization has attained the high degree of perfection with reference to practice work that has been secured at Brown university. Definite arrangements have been entered into with the city school authorities whereby regular observation and practice work is done in the city schools. The professor of theory and practice of education at Brown university is director of the training department in the Providence high schools. He confers with the principals of the high schools and supervising teachers concerning arrangements of hours and classes assigned to the student teachers. * * * Supervising teachers in the city schools are nominated by the professor or education and receive from the university a stipulated sum for each student teacher whose work they oversee."

"Harvard has conditions somewhat similar to those that obtain at Brown university." * * * * "All students in Education

III. are required to observe in all the grades from the kindergarten through the high school and they are required to submit a written report of thir *visits* of observation each week. Graduates and seniors without experience in teaching, if they have a high record in scholorship, may teach for practice in the high schools of Cambridge, Newton, Medford, and Brookline. Each student teaches some one subject for about half a year, and is entirely responsible for the class just as the regular teacher would be."

The universities of California, Nebraska, Indiana, West Virginia, Cincinnati, Rochester and Washington, and Drake university follow some form of this same plan,—using the local city schools for observation and practice; and Leland Stanford sends its students to the normal school at San Jose for the same purpose.

OBSERVATION ONLY—IN LOCAL CITY SCHOOLS.

Cornell university reports: "Visits of high school classes with written reports—20 hours in all, as required by the state for certification of college graduates for teaching." Observation work of this kind, varying of couse in amount, is done by students of education in the universities of Wisconsin, Iowa, Illinois, Colorado and Kansas.

It is noticable that a large proportion of the institutions that use the city schools for observation and practice or for observation alone, speak of their meagre facilities in a tone of apology, and long for a school that shall articulate with their theoretical instruction as closely as the science teacher's laboratory articulates with his lectures. The universities of Wisconsin, Iowa, South Dakota, Texas, and California are forming definite plans for such a school and entertaining the hope that the same may materialize in the near future. No doubt there are other model schools being projected of which we have no report. The university of Illinois has in mind the conversion of its academy into a model school as one of the two alternative plans under consideration.

While these have talked about the things they hope to do, the University of Minnesota, without much preliminary agitation has during the present year, established and opened a model school for both observation and practice. It takes up both eighth grade and high school work and, according to the announcement, "it is the aim of the college of education to make the furnishings and equipment as well as the system of instruction the very best, and a model for all teachers and school boards of the northwest."

SUGGESTIONS FOR THE PROPOSED MODEL SCHOOL FOR THE UNIVERSITY OF NORTH DAKOTA.

I. As a school of observation.

To begin with it is of paramount importance that this institution be a *model school* in the literal sense of the phrase and in every particular; the building, the curriculum and the instruction—every feature of the institution—should be of such a character as to furnish as nearly as possible a faultless pattern to our students and to visiting teachers and school officers from all parts of the state. Let us speak of these items in turn.

First, the building. This should be *complete,* in that it contains all such rooms, facilities and equipment as might wisely be provided in any good high school in the state. This would include a well furnished assembly room, class rooms, library, laboratories, gymnasium with locker and shower bath, toilet rooms, manual training rooms, and offices.

Secondly, the Carriculum. It is needless to say that the usual high school courses in the languages, mathematics, science, and history with civic and economics should be offered. But there should also be included the subjects that our high schools are gradually making provisions for—namely, the business courses, the drawing, music and pedagogy. There has long been a persistent call for these subjects from the patrons of our schools and the way the response to the demand is appreciated is well illustrated by the popularity of the school of commerce here. There is a more urgent demand for educated teachers who can handle these subjects than in any other line. It has been practically impossible for schools to get such teachers, because the colleges refused to give proper recognition to these branches. As a result the high schools that pride themselves on employing only college graduates as teachers are obliged to cast their rule to the winds here and hire anybody they can get.

Thirdly, the Instruction. This school should be a model of what is best for pupils of the high school age, and should not ape the methods that belong to the collegiate grade of instruction. Progress in the high school must be slower, reviews more frequent, the lecture method less common, and the age of adolescence of the students must be taken into account. It is perhaps needless to say that the regular corps of instruction should be composed of superior high school teachers.

II. The model school as a school of practice.

The function of the school in so far as we have now described it, is to give the student of educational processes opportunity to study the same by personal observation. It remains to speak of the institution as a school of practice. As far as we have been able to learn, there is not a college or university in the land having a model school, that does not take the opportunity to give its students of pedagogy some experience in actual teaching. Of course, this policy has not been adopted by the conservative management of colleges without very potent reasons, among which the following may be named:

First. The experience in teaching which the cadet receives under careful supervision and guidance, develops his skill and confidence in a very marked degree, and enables him to avoid many a mistake the first year or two of his actual school room work.

Secondly. It enables the faculty to speak from personal observation when called upon for an opinion of the teaching power of their graduates, and makes their recommendations more reliable.

Thirdly. School officers in employing teachers, attach great importance to the two preceding considerations and generally give preference to a candidate with the experience indicated.

The University of North Dakota may be congratulated upon the very favorable situation for a model school. In establishing such an institution at other places a hundred obstacles must be overcome. Here the process is very simple. All we need is the building and equipment. Only a limited number of students would be needed, and they would come from those sections of the state having no high schools, or where the local high schools offer only one, two or three years of work which these students have finished.

THE MEMBERSHIP OF THE MODEL SCHOOL.

The preceding pages explain the purpose of the model school as a laboratory for Teachers College. A brief description of the school from the standpoint of its students may also be of interest.

Applicants for admission to the model school meet the standard entrance requirements of the state high schools, that is, they have at least completed the common school course. Only a small portion of our students, however, enter with the minimum qualification. The rest of them have completed the one, two or three years of high school work offered by the smaller towns of the state. Very few come to the model school from towns that maintain a full four year high school course.

There are now 170 students in the model school and this will probably increase to 225 or 250 during the current year. It is the plan of Teachers College to limit the attendance of the latter number, because that would be sufficient to give good classes in all the different subjects in which the high schools of the state are interested. With a total enrollment much below 250 some of the high school subjects would be unrepresented, or represented only by very small clasess, and the task that Teachers College has set itself of studying all phases of secondary education and giving the benefit of its observation and experience to the high schools of the state could not be completely carried out.

The average age of all our model school students is twenty years. This is about four years older than the student body of the average high school in the more favored communities of the state. For this reason very few of our young people would feel like entering the ordinary high school. This model school, where they can have work of high school grade and take it in company with others of like maturity of years, is therefore truly a boon to them.

The purpose of the curriculum is two-fold. It offers a first class, general education of high school grade to those who come with no other object in view, and secondly, its numerous elective courses also meet almost any specific demand that the student may reasonably make upon a high school. The following specific ends may be mentioned:

1. The opportunities offered here for a sound commercial education attract a larger number of young people than come to the model school for any other specific purpose. Of the 170 students enrolled at the present writing, 95 are pursuing one or more of our commercial subjects.

2. The courses in manual training and mechanical and freehand drawing, give a knowledge of materials and tools, acquaint the student with some of the underlying principles, and give some degree of skill in the fundamental processes of the industrial arts that are of use in a thousand and one operations in practical life. A course is given in the elements of agriculture that covers the management of soils and the principles of plant and animal growth, and endeavors the contribute to the solution of the problem of agricultural education. Sixty-five students are enrolled in one or more of these industrial courses at the present time. Instruction in domestic economy will also be offered as soon as facilities therefor can possibly be secured. It is the desire of the Teachers College to do every thing in its power to build up a high school that shall give the much needed training in our common industrial processes.

3. In common with all good high schools, the model school furnishes an opportunity to prepare for the regular examinations for a first grade teachers' certificate. Students may not come to the model school with that purpose in view, but, nevertheless, a large proportion turn the education they obtain here to practical account, and many of our former students are now engaged as teachers in the common schools of the state.

4. It prepares students for entering college. This is the traditional purpose for which high schools were first established and the purpose for which our former preparatory department was maintained. With the model school, as with the state high schools, this is now a secondary function, and only a small proportion of our students at present come here for that purpose. Of the present freshmen class in the university, numbering 130, only thirteen came from the model school.

The following shows the number of students enrolled in the different subjects:

Agriculture	6
Algebra	46
Botany	9

Bookkeeping	40
Chemistry	7
Commercial English	16
Commercial Geography	27
Drawing, Freehand	36
Drawing, Mechanical	13
English Composition, Rhetoric and Literature	110
Geometry, Plane	38
German	47
History, General	25
Latin	38
Manual training	11
Music	15
Pedagogy	14
Penmanship and spelling	51
Physical training	90
Physics	49
Physiography	15
Political economy	12
Stenography	35
Typewriting	35

Besides the above there will be classes in civics, commercial law, solid geometry and commercial arithmetic the second semester.

TRAINING HIGH SCHOOL TEACHERS.

On the training of high school teachers, United States Commissioner of Education Elmer E. Brown says:

"The one great need in the university training of high school teachers today is the provision of a laboratory and clinical opportunities, through the establishment of practice and observation high schools."

The Minneapolis Journal, voicing the sentiment of the educators of Minnesota, is urging upon the legislature of that state the duty of providing a building and more ample equipment for the training of high school teachers at the University of Minnesota, and quotes with approval the following letter from C. B. Miller of Duluth, who was a member of the Minnesota legislature. This is so pertinent to the situation in North Dakota that I take the liberty of quoting it almost in full:

MILLER'S LETTER.

Duluth, Minn., Sept. 30, 1908.

Hon. John Lind, Minneapolis, Minn.:

DEAR SIR: I am writing you in your capacity as regent of the state university. Having been somewhat intimately associated with university life for a period of many years, I am very much interested in all that pertains to the welfare of that institution. After leaving the university I spent some years as superintendent of schools in one of the villages of the state, and therefore secured some practical experience in educational work. When I was a member of the state legislature two years ago, among the matters that came up for consideration was one relating to a new building and equipment for the college of education.

Personally I was at once attracted to this cause. It seemed to be just the thing the general educational work in this state at present needs. Such a building and equipment of ample proportions will return to the state a measureless return upon the investment. My practical experience in school work, together with the observations since made, convince me that the greatest need of the state at the present time, outside of certain rural school matters, is a better trained corps of teachers in the high schools. It has well been said that the high schools are the people's colleges, and yet they are not one-half as much so at the present time as they would become in the event of more efficiently trained and capable teachers. The design of the college of education is to furnish to the high schools of the state just such a class of scientifically trained instructors. I further believe the educational thinkers of this state are united on the importance of this item.

I might be permitted to state that the members of the last legislature were very generally in sympathy with the movement to secure such a complete equipment. In fact, I stated at the time when, as a member of the educational committee, we were discussing various pending measures, that this would be the easiest bill of all to put through into a law. The members from the rural communities in particular appeared to see in it a direct benefit to themselves, and whenever the purpose of the bill was explained it met with immediate approval.

Judging from the sentiment which prevailed in the last legislature, I believe the bill at the next session could be put through with united enthusiasm. Perhaps it will be necessary to add that the reason this bill was sidetracked, perhaps largely at my own request, was because we did not want anything to arise that would militate against the passage of those bills designed to secure larger campus, increase in salary, and buildings for the engineering department.

While a great many were disappointed over the failure of the educational college bill, yet I think they all recognized the character of the situation and they certainly acquiesced in the course we adopted, and did so with a genuineness that can but make additional friends for the measure they are immediately interested in.

I trust you will pardon me for writing so much at length in respect to this measure, but it is one that I am deeply interested in and one I sincerely hope the board of regents will recommend and urge, as I know it is one that can be passed with enthusiasm, and when passed the people of the villages and rural districts will alike feel that the legislature has performed an act directly beneficial to themselves.

With sincere regards, I am,

Very sincerely yours,

C. B. MILLER.

DEMAND FOR HIGH SCHOOL TEACHERS.

It is now the almost universal custom to require the completion of a full college course, including special preparation for teaching, for high school positions. California goes a step further and requires a year of graduate work as a qualification for high school teaching. In North Dakota alone, about one hundred specially prepared teachers are needed yearly to recruit the high schools. The state must still depend on other states and eastern institutions to furnish these. In no calling is there a greater demand right in the state—at home. It can scarcely be claimed that the state of North Dakota needs every year one hundred new members of any other profession. But the demand for new high school teachers will continue and will increase. Consequently teachers college should be adequately equipped to supply this perennial demand.

THE NEED OF A BUILDING HERE.

In order to adequately supply the demand, and to secure unity and independence, spirit and dignity, and sufficient room and facilities for the adequate education and training of professional teachers, it is absolutely necessary that teachers college have a building for the various phases of its work. I feel sure that the other educational institutions in the state will heartily support this movement. They are to be congratulated on having been enabled by the last legislature to construct, for their needs, commodious and beautiful buildings, and I feel sure they will all heartily advocate at the coming session a good building for teachers college and its model high school at the State University in which they are all interested.

This building should be built for the future as well as for the present, and should provide ample accommadations also for teachers college laboratory—the model school. Every medical school has its clinic and every normal school has its model school. Every teachers college should also have its laboratory in the way of a model school; and in fact every growing teachers' college in the United States is planning to have its model school if it does not have it now.

As I said, the building for teachers college and model school should be planned and built for the future. The University should hereafter construct larger buildings and thus save the waste in rebuilding, in additions and in abandonments. Moreover, the state should construct building that will be, architecturally, a credit to her at her highest seat of learning. Such a building—serving the double purpose of teachers college and the model school—with all its appointments and equipments will cost not less than $100,000 and the state could profitably and most economically spend more for this purpose if it would build in even a moderately large way for the future.

I believe that all the educational interests of the state will support this request on behalf of our board of trustees at the coming session of the legislature. The high school council of the state, two or three years ago, endorsed the establishment of teachers college and it is the high school interest that is most vitally affected and aided by the establishment and hearty support of a teachers college at the State University, which will not be behind those of other states.

THE AGREEMENT.

I wish to call attention to numbers 5 and 6 of the following agreement, made during the session of 1907, and to say that it has been our wish and our honest endeavor in teachers college to carry out in letter and in spirit those two sections affecting us. We can do but little more—and we have been able merely to make a start—till a building and means are provided by the legislature. We will proceed as soon and as rapidly as we are allowed:

To the Senate Committee on Education:

Gentlemen:

The heads of the various educational institutions of the state of North Dakota, including the following named men: Supt. of public instruction, W. L. Stockwell, President Webster Merrifield, of the State University, President J. H. Worst of the agricultural college, President Geo. A. McFarland, of the state normal school at Valley City, President Joseph Carhart of the state normal school at Mayville, President W. M. Kern, of the manual training school at Ellendale, President E. G. Burch, of the school of science and President Kemp of the school of forestry, having been invited to meet for the purpose of adjusting courses of study and defining scope of certain of our educational institutions, hereby beg to submit the following recommendations for the consideration of your honorable committee:

1. The object of the school of science at Wahpeton shall be to furnish such instruction in the pure and applied sciences, mathematics, languages, political science and history as is usually given in schools of technology below the junior year, the chief object being the training of skilled workmen in the most practical phases of applied science. There may also be offered a general science course of college grade, consisting of three years' work above the high

school course. After the completion of these courses the board of trustees may grant appropriate diplomas or certificates.

2. The scope of the school of forestry shall include such work as is contemplated in an agricultural high school, emphasizing those subjects that have a direct bearing on forestry and horticulture.

3. The committee makes no recommendation with reference to the manual training school.

4. It is the sense of this conference that we recognize the fact that a training in the methods of modern business has a place in any system of public education;

(*b*) That we deplore the superficial methods and mercenary tendencies of many so called business colleges and we believe that the state educational institutions should provide for a reasonable development of this phase of education;

(*c*) It is the sense of this conference that the following subjects are requisites to a thorough course in modern business methods: spelling penmanship, language, including reading, grammar and English composition,arithmetic, geography, political and commercial, civil government, United States history, elements of commercial law, book-keeping, stenography and typewriting.

(d) That this conference also approves the purpose of the unisity to develop its school of commerce into a college of commerce, similar to that maintained at the university of Wisconsin and other universities of similar rank as soon and as rapidly as the public need and the income of the University shall seem to warrant.

5. *That it is the sense of this conference that the preparatory normal work at the University be eliminated and that the state normal schools be limited in their work to a course extending not more than two years beyond the four year high school course.*

5. *That this conference express its approval of the avowed intention of the University at the earliest practicable moment to convert its preparatory department into a model high school to serve as an observation and practice school for the teachers college at the University.*

In view of this agreement and with the co-operation of all the educational interests of the University and the state, I sincerely hope that teachers college may realize, at the hands of the coming legislature, its fondest hope, and that it may secure a building commensurate with its needs and one that will be a credit to the University and to the state as a whole.

THE GROWTH OF TEACHERS COLLEGE.

The first class graduating from the full four-year course of teachers college in 1906 was five; the class of 1907 numbered six; the class of 1908 numbered eleven; and the senior class this year numbers fifteen. The total number enrolled in teachers college this year is about 100. For lack of room, equipment and facilities the conditions are not attractive, if not actually deterrent. With a building and equapment our numbers would be doubled almost at once and the importation of high school teachers available in other states but without training would be decreased.

THE SUMMER SCHOOL.

A summer school for teachers has been held at the University each summer for a period of six weeks. This, I feel, shoud be extended and developed. Thus far, only a few college courses have been offered. The consequence is that scores of our young people from North Dakota leave the state to attend summer schools at other institutions and I believe that many, if not most, of the departments should be open. In that way those whose leisure or available time is during the summer could avail themselves of the opportunity to do college work and have it counted toward a degree. This would necessitate, of course, a force of new instructors and an appropriation for this purpose. But it would be a great service to the state. It is not economy in this latitude to have a whole expensive plant closed all summer.

Respectfully submitted,

Joseph Kennedy,
Dean of Teachers College.

REPORT OF THE DEAN OF THE COLLEGE OF MINING ENGINEERING

University, N. D., October 29, 1908.

To the President of the University:

Dear Sir: The period covered by the past two years has been one of most rapid and satisfactory growth in the college of mining, engineering and the associated departments of metallurgy and chemistry. At the time of my last biennial report, (1906) there were in the lines of work offered in this college, 101 students; at the present time there are 180, making a net increase in the students attending these lines of work of seventy-seven per cent in the two years or thirty-eight and one-half per cent growth per year.

Two years ago there were in attendance nineteen regular mining engineering students. At the present time there are forty-five, making a net gain of 137 per cent in two years. The work offered in the various branches in this department is elected by a large number of others besides the regular mining engineering students.

Instruction has been given in this department to about fifty per cent of all students of college grade with the exception of post graduates and law students. The classes have become so large this year that it has been absolutely necessary to divide them into sections, in order to accomodate them in the laboratories and lecture rooms, and even the divided sections are so large that the laboratories in analytical chemistry are badly crowded.

An appropriation of $10,000 should be made for properly equipping this college as explained under the heading "Support and Recommendations."

The work of instruction in this department and the interest manifested by the students in their work has been very satisfactory. The instruction given has conformed to the general curriculum, as will be seen by referring to these courses. The college of mining engineering of the University of North Dakota has already developed a strong and practical course; one which compares favorably with that of other older institutions. The work of this college has an excellent standing as will be seen from the recognition given our graduates by older institutions and by positions proffered to them. In the mining field, graduates of this college have readily obtained excellent positions and have performed their work most creditably.

There is a growing demand for trained mining engineers and many of the young men in our state are glad to avail themselves of the advantages offered in this line of work.

When North Dakota was admitted to statehood the United States government made provision for the establishment of a school of mines. By legislative act of March, 1890, the school of mines was made a department of the University of North Dakota and received a grant from the United States government of 40,000 acres of land, thus becoming the only separate college of the University having a distinct endowment.

The wisdom of this act is manifest in that it makes provision for a technical education in an industry which is, perhaps, second only to that of agriculture in importance in building up a commonwealth. The rapid development of our resourrces has resulted in a demand for the most skillful and best trained specialists our schools of mines can produce. Those seeking the services of such young men will not be compelled to go outside our own state for them. Nor will our young men who wish to fit themselves as mining engineers, metallurgists, industrial chemists, etc., be forced to go to eastern states, at much greater expense, to secure an education.

The value and importance of the provisions made for technical training of this kind is well brought out in the following extracts from an article in The Student: "When in 1890 the federal government established the school of mines and granted to the state 40,000 acres of land for its maintenance, it exercised a forethought which will prove of incalculable value to the youth of the commonwealth. North Dakota is a great agricultural state and will always remain so, but its mineral resources will sooner or later prove themselves of immnse value to the state. The federal government recognized this, and it further recognized the fact that trained men were necessary for the development of these resources, that trained ment alone could develop them.

"A large area in the western portion of the state, covering probably more than 25,000 square miles, as demonstrated by the geological survey, is underlaid with coal. Already in 1907 more than $407,000 worth of coal was mined in the state, but there is no reason why this should not be increased twenty-fold. Another almost unlimited resource of North Dakota is building stone. Scattered over the state are deposits of the finest standstone awaiting scientific development.

"Nor is this all. Those who visited the St. Louis or Portland fairs were surprised to find in the North Dakota booth an array of the finest white stone china and table ware of every description, equalling the best English make, ornamental ware, vases and jardinieres decorated in the highest art, all made from the undeveloped North Dakota clays.

Within our borders are to be found some of the finest pottery clays in the United States. But these are awaiting capital and talent for their development. With fuel close at hand unexcelled opportunities are offered for the establishment of stone ware and sewer pipe industries.

"And these are only a few of our undeveloped mineral resources. No one can longer maintain but the opportunities for talent and capital are worth investigating and developing. And none can doubt the wisdom of those who provided a school for the training of men to develop them.

"Yet these are not the only reasons why a school of mines is maintained in the state. The North Dakota youth as he grows up may aspire to something different from what the state offers. He may wish to share in the many opportunities afforded by the great northwest in the development of industries connected with mining. And it is only proper that his own state should give him such an education as he may find necessary to avail himself of such opportunities. The parent rightfully demands that our educational system be so broad in its scope that it can provide a training which will qualify his son to fill well whatever profession he may choose wherever fortune may lead him to practice it. The far-sighted man cannot help but see what this vast field has in store."

PRACTICAL TRAINING.

The school of mines of the University of North Dakota aims to give a strong techincal and practical training which will fit young men to fill successfully important positions in the various branches of the mining industry. This is made possible in a large way on account of the connection of this college with the University. Here every mining student has all the advantages of a university with its specialists in the various departments of instruction, with its library, its well equipped laboratories and machine shops.

The work of instruction in the college of mining engineering falls under several departments. The foundation and bulk of it, however, is given by the departments of chemistry and metallurgy and geology and mineralogy. The course of study, while embracing the more important technical subjects of mining engineering, includes also a number of subjects which add breadth and versatility. Recognizing the fact that a mining engineer may need a familiarty with a wider range of subjects than it is possible to include in the regular mining curriculum alternative groups are offered.

Mining engineering opens a variety of attractive fields of work in connection with metallurgy, geology, surveying and other engineering subjects. On account of natural aptitude or of circumstances students may desire to specialize along these lines.

Accordingly courses of study have been arranged so that students wishing to emphasize the geological side will elect additional subjects along that line, while those wishing to emphasize surveying and similar engineering subjects will elect subjects especially designed for such work. These are all strong courses and are well suited to prepare young men for the active occupations of life upon which they expect to enter after graduation. It is the aim to send out young men who are well equipped and who will do themselves and the University honor.

The positions which the mining engineering graduates are being called upon to fill are responsible and remunerative ones in various mining regions of the west. They serve as managers, superintendents, assistants, assayers or in other capacities in this and other states where well trained men are needed.

FIELD WORK.

At the close of the second and third years, during the summer vacation, students are required, as part of their course, to spend three weeks in some mining region for the purpose of studying the geological conditions, mineral formations, the work of mining, milling and reduction. The time is spent under the direction of the professor in charge. All of the geological and mineral conditions of the region are carefully studied, as well as the methods of mining and ore treatment. Notes, sketches and reviews are required of each student and while in the field daily meetings are held for discussions and explanations. The datum secured in the summer field is made the basis of systematic work in platting, designing, etc., which is carried on the following year. Different regions are visited successive years in order that the student may become familiar with representative mines and methods of operation in different lines of mineral production.

Arrangements are frequently made so that mining students who wish to can spend their summers in remunerative employment in various mining regions and in work which affords excellent training for them in connection with their future profession.

The young mining engineer must not only become familiar with mining operations but he must also be a practical man and one skilled in the manipulation of the appliances used in the various departments of the mining industry. For this reason much care is given to the technical and practical equipment of this college.

LABORATORIES AND EQUIPMENT.

A large part of the technical work of this college is carried on in the mining and chemical engineering building. The work in geology, mineralogy, physics, surveying and mathematics is provided for in the laboratories and lecture rooms located in science hall. The drawing and shop work is carried on in the mechanical engineering building. The classes in languages, literature and other similar subjects are held in the main building.

The chemical, metallurgical and mining laboratories, and the furnace rooms and testing laboratories for gas, coal, cement, and building matearials are located in the newly erected mining engineering building. This is a substantial pressed brick building three stories and a half in height. In this building s carried on the various lines of work in chemistry, metallurgy and mining.

In the north wing on the third floor is found the large laboratory for the general chemistry. The tables are supplied with water and gas, and contain cupboards for apparatus and supplies. The general recitation room is connected with the general laboratory. This lecture room is provided with hoods, lecture tables, lantern, and other special apparatus for demonstration purposes. A store room for chemical, glassware, and special apparatus is in close proximity to the lecture room.

Adjoining this in the south wing is a small laboratory for special work in organic analysis, water, air, and gas analysis. It is fitted with apparatus for research, and for sanitary and industrial chemistry.

In the same wing will be found the ore-testing laboratory, provided with a small pulverizing machine, amalgamating apparatus, a cyaniding outfit, tables for ore panning, a model laboratory jig (Vezin Jig) and a model slime table, and other apparatus for ore treatment in small lots. An electrolytic bench is also provided with a variety of currents for different kinds of electrolytic ore treatment. This laboratory and the shop for repair and construction of apparatus, which is connected with it, are both supplied with electric motors for power.

On the second floor is found the lecture room for classes in metallurgical chemistry, assaying, ore treatment, etc., the office, a reference library, private laboratories, store room, and a small reading room, while in the north wing is located the laboratory for metallurgical chemistry.

Adjoining this laboratory is the balance room and connected with the balance room is the metallurgical laboratory, fitted in a manner similar to the analytical laboratory and supplied with apparatus for wet assaying and other typical work in metallurgical chemistry.

In the south wing of the first or ground floor is the cement and clay testing laboratory, a gas and coal testing laboratory, and an assay mixing and charging room which connects with a large room adjoining, in which are located a variety of furnaces for assay and metallurgical work and the testing of clays for brick, pottery, and various other purposes.

The north wing of the basement is devoted to mill machinery. This wing is excavated much deeper than the balance of the basement in order to give room for the complete model concentrating plant two stories in height, and for other machinery. The concentrating plant is a perfect working model of the latest type machinery, sufficient in size to run several tons of ore and make perfect milling or concentration tests. The students are taught to run this plant and are able to become familiar with the actual methods of operating the larger concentrating mills.

In this wing there is also a model five-stamp gold mill with amalgamating plates, and a model cyaniding plant where actual work in stamping, amalgamating, and cyaniding may be carried on. In association with the stamp mill are found coarse and fine crushers of various types and pulverizing machinery, such as tubes, mills, disc pulverizers, etc.

In one portion of this wing is located a model pressed brick plant of the best type of machinery, capable of turning out 15,000 quarter-dimension bricks each twelve hours.

These various plants enable the students to carry on, by actual commercial processes, the methods of treating ores, working clays, and handling other mineral products.

It is the aim to add appliances as rapidly as possible so that there may be built up a thoroughly equipped plant for all lines of experimentation and for the thorough and practical testing of building materials, fuels and minerals of all kinds. Several thousands of dollars are urgently needed for this additional equipment.

Special training will be given to fit men to develop the mineral industries of our own state. The coal and clay industries, which are destined rapidly to become large mineral wealth producers, will receive special attention. In connection with the great coal deposits of this state careful study will be made of the character of the coal, the best methods of mining, handling, storing, and burning. In work with the clays the student will first be made to determine the value and uses of the various clays, by analysis, and then he will be made to work the clay into the various wares for which it is best adapted. For this purpose the model brick plant and several small clay working machines have been secured and others will be added as funds permit until the student can produce and burn in kilns a large number of clay wares, such as bricks, tiles, fire bricks, sewer pipes, jugs, jars and various dish forms.

EXPERIMENTAL AND TESTING DEPARTMENT.

Besides the technical instruction in the courses of mining engineering, surveying, geological engineering other associated subjects, an important part of the work of the school of mines is in what may be called its department of experimentation and economic development. This department takes up all kinds of practical investigations of the mineral resources of the state with a view to proving, by actual tests, their economic value as well as the best methods for their utilization. These investigations require a large amount of time as well as much equipment. A great deal of such work has been done by the college of mining engineering on the practical utilization of the coals and clays, building stones and other mineral products of the state. In this way the school of mines has been instrumental in demonstrating not only to the citizens of the state but also to the people of other states, that there are vast deposits of a variety of minerals the value of which has hitherto been but little appreciated.

The hope is to make the school of mines a department from which the people of the state may secure practical tests or any other aids which can be given to help in the development of our mineral resources. There are few people who appreciate the great value of these undeveloped resources or the enormous advantages which might be derived by successfully building up manufacturing and mining industries in an agricultural region. Such service will always be an important feature in the work of the school of mines.

It is the ambition of the college of mining engineering to serve the state in every way possible, not only by aiding in the investigation and development of its resources, but also by sending out young men who shall be well fitted to fill important places in their profession with credit to themselves and to the University and who, with a training cultural, scientific and technical, shall have sufficiently broad and high views to become active, useful and noble members of society.

SUPPORT AND RECOMMENDATIONS.

The growth of the college absolutely demands a better equipment in the way of machinery and apparatus.

A small building was erected for the school of mines and the department of chemistry. But this building has already been taxed to its utmost to accomodate the large number of students taking work in the lines of engineering, metallurgy or chemistry taught in it. As has been said, it has already been necessary to divide the classes in order to accommodate them in the lecture rooms and laboratories, and even these divisions are too large for the laboratories, desks and equipment now available. Extra desks, hoods, work-tables and additional sets of apparatus sufficient for the use of each student are now greatly needed. Additional furnaces and testing apparatus is also greatly needed to carry on the technical work of this college, and also to provide means for experimental testing of our mineral resources, such as coal, clays, building stones, etc. It is very important that facilities for this kind of work be at hand so that our young men may be thoroughly trained in the practical methods of handling our own native resources. With proper equipment the college of mining engineering could send out into the state many young men who would be immediately qualified to take up and develop many of our untouched resources. Such a development of mineral and manufacturing industries in this state would be of vast importance to all people of the commonwealth. There is a very wide field of usefulness which properly belongs with the college of mining engineering in aiding such development. This work, however, demands much equipment in the way of practical working machinery, such as is used in actual industrial operations and also considerable expenditure in devising special methods for treating our coals, clays and other building materials. There are few places where the state could make a small investment to better advantage than by providing such equipment for the school of mines. At least $10,000 should be appropriated for properly equipping the laboratories, testing departments and the experimental work of this college, and the appropriation of this amount is urgently requested from this legislature. Every dollar invested by the state in this manner will be returned many fold by the development of our resources thus stimulated and by the sending out of men trained for solving the practical problems which are presented in the utilization of our various mineral resources. Even with the very limited equipment and funds at our disposal, a large amount of work has been done and some progress has been made towards solving certain problems in connection with th utilization of our coals, clays, stones and other materials. This practical testing and experimental work requires, however, a great deal of time and effort and more funds than have been available. I have touched upon a good many problems in the work of this department, and these beginnings indicate that further work may bring results of far greater importance to the state.

In the following pages a brief summary or outline of a few problems investigated will be mentioned.

SCHOOL OF MINES.

EXPERIMENTAL AND TESTING DEPARTMENT.

(Biennial Report.)

For a more detailed report see the bulletins of the college of mining engineering.

The following is a summary of some of the work of the testing and experimental department of this college. In addition to the work of instruction those in charge of the subjects of mining, metallurgy and chemistry have done a great deal of hard work in analyzing and testing all kinds of material sent by the citizens of the state. As far as possible these departments have aimed to be of service to the people of the state in the solution of a great variety of economic and industrial problems. During the past two years a great variety of work has been done on all kinds of material. Duding this time probably between twelve and eighteen hundred different determinations have been made. A large proportion of which demanded great care and considerable skill inasmuch as they were of analytical character, requiring the exact composition and proportion of constituents in the material examined. This work was also accompanied by reports or letters of explanation to those sending materials. It will thus be seen that many people throughout the state have been helped in this way in problems more or less important to them.

A part of this work may be summed up under the following divisions:

Analyses and tests of lignite coal.

Deterination of the heating power of lignite.

The examination of lignite for producer-gas.

The production of gas for heating and lighting.

Examination of the quality of natural gases recently discovered in the state.

The analyses of clays.

The testing of clays for building brick, sewer pipe, pottery, fire proof material, etc.

The testing of cement materials used in construction in a number of places.

The analysis and testing of building stone.

The analysis of tars and the testing of paving materials.

A large amount of work in the chemical and physical testing of illuminating oil and gasoline required under the state oil inspection.

The assaying of ores of all kinds.

The investigation of problems in connection with coal mining and clay working.

The chemical analysis of water.

A variety of work of more or less importance.

It is impossible in this report to give a detailed statement of the above lines of work since the mere records and reports of these tests would fill a good sized volume. More extended work has been done along some of these lines and bulletins have been or will soon be published, giving preliminary investigations. In some of these cases a brief outline sufficient to give an idea of the character of the work done will be given in this report and more complete information on these subjects can be gotten by referring to the special bulletins dealing with these various investigations.

Tests and Experimentation on the Value and Use of Lignite Coal.

The existence in this state of vast deposits of lignite coal has been a fact well known for some time. The work of the geological survey has made known an increasingly large area underlaid with this kind of coal, but on account of the peculiar properties of lignite and because stoves, heating plants, boilers and most of the appliances in which coal is used for different purposes are designed for anthracite or some form of soft coal, the introduction and use of lignite has been slow. Notwithstanding our vast deposits of lignite, hundreds of thousands of dollars are spent for coal shipped from distant states while our own resources remain but slightly developed. This condition of things will remain to a greater or less extent until improved methods are found for burning lignite and using it for production of steam power, gas power or gas for lighting and heating. For this reason investigations with reference to the best methods of utilizing our lignite coal for various purposes is of importance to the people of this state. The investigations of the problems lie directly in the province of the college of mining engineering and form one of the many lines of work which were originally expected of the school of mines, when the college was established by the United States land grant and the state. Several lines of investigation of the coals, as well as other mineral products, have now been well started by the school of mines and it is hoped that many practical and helpful results will be brought out which may render these resources much more valuable and more extensively utilized. In this place it is possible to give only a few paragraphs taken from reports to be issued by the school of mines relative to the investigations of coals.

It is evident from the investigations which have been carried on that the heat value or calorific power of the average lignite of North Dakota, when entirely dry, is about 65 to 70 per cent of that of the Hocking Valley coal, and about 60 per cent of that of Pocahontas coal.

The analyses which have been made show that the fixed carbon in the samples of North Dakota coal (dried) usually runs from 45 to 50 per cent; that of West Virginia bituminous coals about 67 per cent; that of the better grades of semi-bituminous, dry coals of Maryland, 75 per cent, and that of the fine, dry, close burning bituminous coals of Pennsylvania 70 per cent. Using this method of determination, the heating power of one ton of North Dakota coal will equal about 65 per cent of bituminous coal.

The purity of a fuel is a very important element in determining its value. A difference of 2 or 3 per cent in the earthy matter of two coals may be the source of a very serious difference in their final value. North Dakota coals are almost always very free from earthy matter as seen from the amount and character of their ash.

The remarkable freedom of North Dakota coals from sulphur is no small advantage.

Another important matter in the economics of coal is the character of the ash. In many coals a large amount is lost in ash and clinkers. For all purposes it is desirable to have small clinkerless ash. This is especially desirable in certain cases where intense or melting heat is required. A small ash of reasonably white color is a good characteristic. The ash of North Dakota coal seems very free from clinkers, of good color, and is moderately small in amount.

By these comparisons it will be seen that North Dakota lignite ranks, so far as its heat producing power is concerned, between the ordinary lignite and a bituminous coal, and that it is far superior to the lignite mined in some other countries.

It seems evident to one who has made a study of the problems connected with the use of lignite coal in North Dakota, that this fuel is sooner or later sure to become the principal source of supply for large areas of this state and for portions of adjoining states. North Dakota coal, though lignite, is of a high grade. It may safely be predicted that its use will be extended rapidly.

As compared with wood, there no doubt that, for ordinary purposes, this coal is far superior at reasonable prices. It is to be hoped that little timber will be burned in North Dakota where so much better and usually cheaper fuel can be secured. In some localities it is sad to notice how much wood is cut for fuel. Every tree should be encouraged to grow. If tree culture were what it should be in North Dakota the good resulting would be of inestimable value.

For general manufacturing and heating purposes, in which most of the fuel is used, the coal of North Dakota is well adapted, especially if burned with proper draft or blast arrangement. By the use of native coal, hundreds of thousands of dollars might be kept within the state and encouragement given to the development of an important resource.

From about 100 analyses of lignite coal made in the laboratories of this department the average composition of the dried coal would be about as follows:

	Dried Coal Approximate Average
Fixed carbon	52 per cent.
Volatile matter	40 per cent.
Ash	8 per cent.

Moisture from coal fresh from the mine runs from 20 to 35 per cent.

In order to arrive at an estimate of the value of briquettes for fuel a considerable experimental work has been done on the production and testing of lignite briquettes. Duplicate tests have been made of an excellent grade of soft coal, Yougiogheny screened lumps, to use as a basis of comparison. The following are the results of analyses and tests of several briquettes and coal to compare with laboratory made lignite briquettes:

BRIQUETTES B.

	Per Cent
Specific gravity	1.26
Moisture	4.1
Volatile matter	37.9
Fixed carbon	49.3
Ash	7.3
Sulphur	1.4

BRIQUETTES C.

	Per Cent	On Basis of Dry Coal—Per cent
Specific gravity	1.04	
Moisture	10.6	
Volatile matter	41.9	46.8
Fixed carbon	38.0	42.5
Ash	9.5	10.7
	100.0	100.0

YOUGHIOGHENY COAL.

	Per Cent	On Basis of Dry Coal—Per cent
Specific gravity	1.2	
Moisture	1.2	
Volatile matter	29.9	30.2
Fixed carbon	64.1	64.9
Ash	4.8	4.9
	100.0	100.0

STOVE TESTS.

A series of stove tests were made, using the soft coal, of which analyses is given above, and two lots of briquettes. The stove was a small size, soft coal, laundry stove with a flat top on which a pan of water was placed for the evaporation test. The conditions were maintained as nearly identical as possible for all the tests, excepting that in the use of briquette test No. 2, the draft was checked on the lignite after the fire was thoroughly started. In this test, however, the maximum results were not obtained since the control of the drafts were not complete and the stove was frequently opened for examination of the condition of the briquettes. The results were better, however, indicating that with proper regulation still better results might be expected.

The evaporation test is not as high with either soft coal or briquette test as could doubtless be secured were the construction of the stove top different. This is especially true with regard to the briquettes, since for maximum results the top heating surface should have been considerably nearer the fire.

Lignite Coal Briquettes
Made at the School of Mines.

In the soft coal test and the briquette test No. 1 the conditions were nearly identical. The drafts were kept open and in each case 10 pounds of fuel were taken with 1 pound 4 1-2 ounces of kindlings, exactly the same material. The amount of water used was 3000 c. c. The room was 12x19x22 feet. The stove and thermometer were near the middle. Doors and windows were kept closed. The stove was cold before each test. The time of reading was nearly the same in each case.

Time After Starting Fire	Tem. of Air Degrees F.	Tem. of Water Degrees F.
Start	70	67
After 15 minutes	91	156.5
After 30 minutes	101	176
After 1 hour 35 minutes	92	162.5
After 2 hours 5 minutes	94	163.5
After 2 hours 35 minutes	89	147.5
After 3 hours 5 minutes	84	124
BRIQUETTE TEST NO. 1 C.		
Start	77	68
After 15 minutes	95	144
After 30 minutes	108	189
After 1 hour 35 minutes	86	132
After 2 hours 5 minutes	85	113
After 2 hours 35 minutes	82.5	102.5
After 3 hours 5 minutes	80.5	93.5
BRIQUETTE TEST NO. 2 C.		
Start	75.5	70
After 15 minutes	93.5	145.5
After 30 minutes	99	185
After 1 hour	91.5	167
After 2 hours 35 minutes	81	111.5

	Soft Coal	Briquette Test No. 1 C	Briquette Test No. 2 C
	°F	°F	°F
Average temperature of air for 2 hours, 34 minutes	89.5	88.9	88
Increase of average above starting temperature	19.5	11.9	12.5
Increased temperature of air:			
15 minutes after start	21	18	18
30 minutes after start	31	31	23.5
3 hours after start	14	3.5	....
Increased temperature of water 3 hours after start	80.5	41.5	....
Water evaporated 3 hours, 5 minutes after start	2160 cc	1170 cc	....
(Fire nearly out in each case)			
Water evaporated after fire was completely out. Fire retained longer than in No. 1	....	....	1440 cc
Ash and waste	*6.8	*11.9	....
(14 oz. soft coal unburned)			
(No clinker in briquette ash)			

*Per cent.

In each case combustion took place readily but was rather more marked in the briquettes. In briquette test No. 1 with open drafts the stove was red from fire pot to stove pipe within 25 minutes from the time the fire was started. The flame was of excellent quality, there being much less smoke than with the soft coal and there was no objectionable odor. The briquettes being somewhat porous, burned rapidly and intensely, no doubt more rapidly than they would if formed under higher pressure, in which sace they would be more dense. For this reason better effects are secured by regulating the draft rather closely, as the fire is retained much longer. The combustion of the briquettes was excellent and they held their form until the fuel was practically all burned out when they dropped down to a fine ash if shaken or touched with the poker. There was a slight tendency in the briquettes to coke and this doubtless would help to hold them together. The fact that the briquette holds up so well during handling and burning shows a great advance over the unbriquetted lignite in this respect.

Summing up the stove tests I should say that the briquettes showed about 64 per cent of the heating value of the soft coal.

COMBUSTION TEST.

Combustion tests with both soft coal and the briquettes were made in the laboratory with an apparatus especially devised which permits more perfect combustion than that secured in a stove. The condition in each case was exactly the same. This apparatus permitted more perfect combustion of the light volatile gases which are characteristic of lignite and which escape in considerable quantities unconsumed. These tests showed the heating and the evaporating power of the briquettes to be 75 per cent that of the soft coal. It will be seen that this test gives a much higher relative value to the briquettes than does either the stove or the ordinary calorific test, this being due, as already mentioned, to the utilization of the light hydrocarbons of the lignite.

CALORIFIC TEST.

Several ordinary calorific tests were made with the soft coal and the briquettes. The following is an average of the results in each case.

Soft coal, calorific value..................	8481 calories.
C briquettes, calorific value	4875 calories.

Based upon calorics, the lignite briquettes have a value of 58 per cent of the soft coal.

It will be seen by summing up the relative values in the different tests, including the analyses, that the average gives the lignite briquettes about 65 per cent of the heating value of the soft coal, and I think that this is a very fair estimate. Of course, the better the grade of lignite coal the higher will be the heating value of the briquette.

It must not be expected that any process of briquetting will change the lignite into bituminous or hard coal nor greatly modify the composition of dry lignite. The chief advantages to be gained in the briquetting of lignite are the prevention of the slaking so characteristic of the natural coal; the holding together during combustion; the prevention of matting in the fire box, that is, holding up in shape and burning freely; uniformity in size, cleanliness in handling and decrease in the loss caused by dusting and slaking. In addition to these points, briquettes can be used to better advantage in a variety of stove and are under a more perfect control than the ordinary lignite. The advantages to be expected from briquetting are not so much the increased calorific power due to chemical or physical changes as the fact that the lignite is put into a form which can be burned satisfactorily and subject to control. These tests were made simply on experimental lots or briquettes.

Of course from a commercial point of view it is important to know that perfect briquettes can be produced on a large scale rapidly and at sufficiently low price to admit of their being shipped and sold at whole sale at a fair profit. However, from the experimental work which has been carried on at the college of mining and engineering, there seems to be good reason to be hopeful of securing in time a practical solution of this problem.

LIGNITE GAS PRODUCTION.

At the present time lignite coal is chiefly used in the lump form in heating and cooking stoves and in engines for power. It seems probable that the briquetting of lignite will be gradually brought to a successful commercial basis. It will then not only make our lignite coal much more serviceable and generally used, but it will also save an immense amount of slack coal which would otherwise be watsed. But lignite is undoubtedly adapted to the production of power and probably for lighting purposes. It will be noticed by referring to the analyses of lignites that they are rich in volatile watter which is mostly in the form of light gases easily driven off from the coal by heat. In the regular process now used for the manufacture of illuminating gas from coal there is left a residue generally known as coke, which has considerable market value. Heretofore the difficulty in the use of lignite for the production of gas has been that the carbon, remaining behind, did not form into lumps like coke, but broke up into small particles which were of no commercial value. Thus while the amount of gas produced from lignite was reasonably large, the waste of the non-cooking residue was so great as to render the manufacture of gas from this coal unprofitable in most parts of the state.

There has recently been developed, however, a new system for the manufacture of gas from a variety of fuels. This is known as the producer-gas method and at the present time is applicable almost exclusively to the production of the gas capable of generating power in a specially designed gas engine. The development of the producer-gas for power has been quite rapid and while the details of the problem have not all been settled by any means, still the results which have been achieved, are so remarkable that there appears a great future for power production from producer-gas. Many fuels of comparatively little value, as used under boilers in the old direct burning method, have been made to yield very excellent results when untilized in the producer-gas plant. The more perfect utilization and saving of our coal and the cheaper production of power thus brought about, are items of great interest to every citizen. Whatever method will bring a cheapening of power, is sure to result in great saving and benefit to all classes.

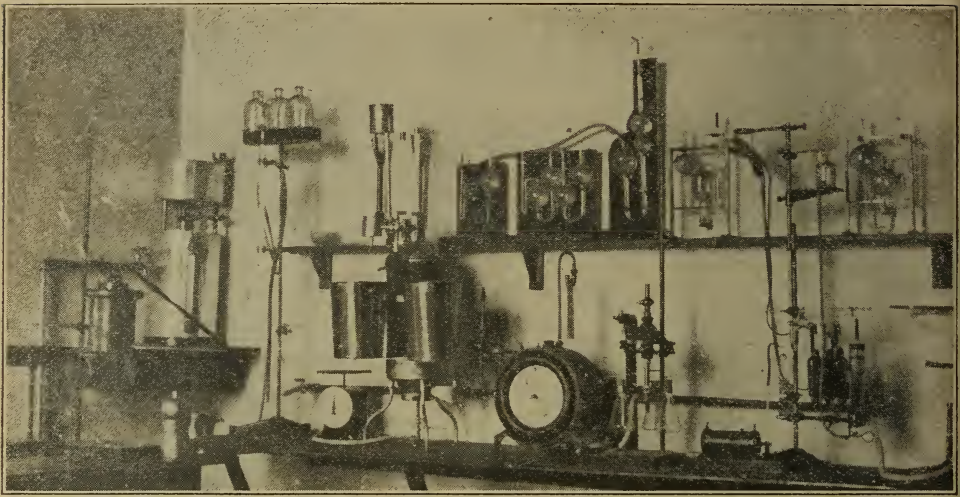
The perfection and introduction of the producer-gas plant will be welcomed by our citizens as a possible means of an economic utilization of the vast beds of lignite which are distributed in the western portion of the state. Until about three or four years ago only very slight attempts had been made to utilize lignite as a gas producer. During the time of the world's fair at St. Louis a model producer-gas plant was put in operation by the United States government and under the direction of Dr. J. A. Holmes of the fuel testing department of the United States.

Surprisingly successful results were obtained in the use of different coals for the production of gas for power. The work which has been carried on at the school of mines indicated at once the possibility of successfully using lignite coal in this producer-gas plant. I therefore arranged for the testing of two or three carloads of North Dakota lignite at the government testing plant at St. Louis. The coal was shipped in carload lots and carefully tested in the government experimental plant. The results secured were very surprising, for it was found that North Dakota lignite used in the producer-gas plant gave more power than many of the eastern bituminous coals burned by the old method and that as a gas producer, at least for power, it ranked high among the various coals. This at once opened a future possibility of great importance to our state in the utilization of the lignite.

Since the fair at St. Louis some efforts have been made by manufacturing companies to perfect plants which would satisfactorily operate with lignite coal giving as good results as those obtained with the government plant. While considerable progress has been made along these lines, there are yet many details to be worked out before this process will be generally adopted for the utilization of lignite for power purposes. However, these are only matters of detail which can be worked out satisfactorily, in as much as the fundamental features have been successfully wrought out. There is no question but that in a short time producer-gas plants will be in successful operation in small and large units for utilizing our lignite for a variety of purposes. While this will prove of great value to all parts of our state, it will be of special importance to those communities near the great lignite deposits in the western portion of the state, for in many of these places it will no doubt be posible to establish large power plants, utilizing the waste from lignite deposits in the producer plants, converting these wastes into electricity which in turn may be sent to surrounding towns and villages, thus distributing power and light from numerous central power plants. Such an arrangement will not only be a great saving of our fuel resources but will also result in establishing many industries which can be developed by abundant and cheap electric power.

It seems probable that we shall be able shortly to produce gas from lignite, which can be converted into power with a saving of 25 per cent or more. This work means, in aggregate, the saving of large sums for the citizens of this state. The college of mining engineering has begun a series of extended investigations on the various methods of producing gas from lignite, with a view to showing its utility and economy for lighting, power and heating purposes. These investigations have not proceeded far enough to be considered in detail at this time; however, the results thus far secured are very promising.

A report of this work will be published at a later time.



Gas Testing Laboratory.

CLAY TESTS.

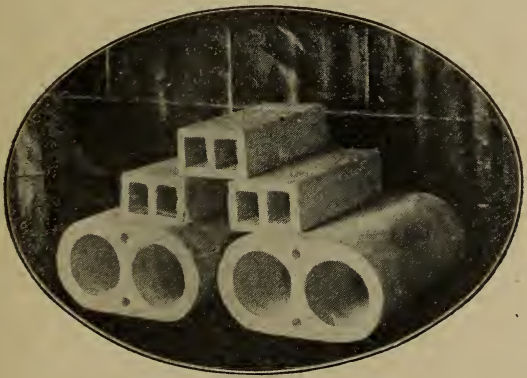
Among the mineral resources of our state the clays are second only in extent and economic value to our deposits of coal. North Dakota is remarkably well supplied with a variety of valuable clays well fitted for utilization in the manufacture of many important products. These deposits are usually quite extensive and many of them are found not far removed from lignite coal beds, a fact which will greatly enhance the value of both deposits. The variety of the clays found in this state is really unusual, ranging as they do from common brick clay to deposits suited to the production of high grade pottery. It is a matter of great importance to the state to determine by experimentation and practical tests to just what uses these various deposits can best be put. In this work of experimentation and practical testing of clays the college of mining engineering has been intensely interested and has made considerable progress. A great deal of work has been done in the way of analyzing and making laboratory tests and finally in making these clays into a variety of products such as common bricks, pressed bricks, fire bricks, drain tile, sewer pipes, jars, jugs, dishware and art pottery from clays, which chemical and other preliminary tests indicated were suited for these various purposes. These wares were made as far as possible in the testing department of the school of mines but in several cases the products were made by companis manufacturing such wares as drain tile, sewer pipe and dishware. These tests were preceded by exhaustive tests in the laboratories of this college so as to select the proper clays for the definite purposes. The tests which have been carried on thus far, both in our laboratories here and in factories, have been extremely satisfactory and encouraging and it is the purpose to continue this line of investigation so as to be of still greater service in developing a variety of industries based upon our clay deposits. A brief outline is here given of some of this work. More complete information may be secured by referring to a bulletin on "The Practical Tests of North Dakota Clays."

The following are some of the uses to which the various clays of the state are suited, as indicated by the investigations of this department:

Architectural materials, such as brick, terra cotta, paving brick, etc.; refractory materials, such as fire bricks, stove lining, etc.; semi-porous ware, such as drain tile, flower pots, etc.; stoneware (semi-vitrified or partially glazed), such as sewer pipes, jars, jugs, etc.;earthenware (white or yellow body, taking good glaze), such as table ware, sanitary ware, ornamental tiles, and art pottery.

The value of a clay for a given purpose often depends upon some apparently small point in connection with its composition or physical character. For example, the color may be wrong, the fusion too low, shrinkage in drying or burning too great, or the presence of some unnoticed impurity, any one of which may be sufficient to render the clay unfit for the purpose desired.

North Dakota has many excellent deposits of clays fitted for both common brick and facing brick. At Hebron and Dickinson pressed brick of the highest quality is produced, and at these places some of the clays are high grade fire clays. Samples have frequently been tested to a temperature of 3,000 degrees Fahrenheit or more without vitrification.



Hollow Fire Proof Ware from North Dakota Clay.

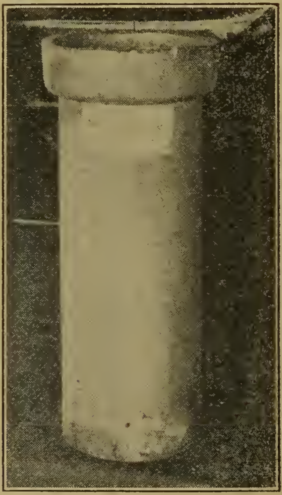
The following analysis of North Dakota fire clay will indicate the character of some of these clays:

	Per Cent
Silica	65.03
Aluminam	23.16
Iron oxide	1.00
Lime	0.29
Magnesia	0.44
Loss on ignition	7.21

Many practical tests have been made in these laboratories in stoneware clays. These have been so satisfactory in some cases that the clays thus tested have been shipped in larger quantities to eastern sewer pipe and stoneware factories and made up into full size sewer pipe and other products. They were found to work very easily in the machine, to dry without undue shrinkage or cracking and to stand firing and glazing satisfactorily. The products were first class in all respects.

The following analysis is one of many North Dakota stoneware clays which were analyzed or tested:

	Per Cent
Silica	63.19
Alumina	23.35
Iron oxide	1.49
Lime	0.29
Magnesia	0.98
Loss on ignition	7.82



Sewer Pipe from North Dakota Clay

Considering the high character of these North Dakota stoneware clays, their proximity to coal and in some cases nearness to railroads and considering also the rapidly increasing demand for stoneware products, especially sewer pipe throughout the state, there would seem to be a good opportunity for the development of this phase of the clay industry.

Clays for good earthenware must, besides being plastic, be as free from iron as possible, and sufficiently free from alkalies to stand much heat. They should bake white and give a strong, solid body. Most of the requisites are those of a first class white plastic fire clay. The special differences are that an earthenware clay should be freer from iron than it is necessary for a fire clay to be, and that a fire clay should be freer from alkalies than it is needful for an earthenware clay to be.

The commercial value of earthenware clay depends upon the character of body it produces and to a large degree upon its whiteness. The appearance of the unburned clay cannot be relied upon as a safe criterion of the color of the biscuit. It frequently happens that clay which to the eye seems to be pure burns to a creamy tint, while on the contrary, clays darkened by carbonaceous matter often burn to remarkably white ware. But for pottery the ultimate color of a clay cannot be absolutely relied upon without subjecting the biscuit to a test with the glazing material, as the glaze often brings out tints not noticeable in the bisque.

There are so many facts to be considered in the selection and use of potter's clays and mixtures that no detail of composition or character of the raw materials can be overlooked with safety. In fact the best results are only to be secured after considerable experience with given clays.

Although clays sufficiently pure for white earthenware are comparatively rare, North Dakota is particularly fortunate in having a few beds of clay of this kind of a remarkably fine character. Many analyses of these clays have been made and they have been subjected to many practical tests at the school of mines. A great many different products from these clays have been made and in practically all cases the results have been exceptionally satisfactory. Most of the white earthenware clays are remarkably fine grained, plastic, easily worked on the potter's wheel and are readily molded. There is little tendency to crack in drying or firing and the bisque burns to a white or creamy white body which at the proper temperature takes the glaze with ease.

Some of these clays, as seen by the analyses, are remarkable in having a composition very similar to many of the artificially prepared clay bodies after they have been built up to the proper composition, often by several mixtures. A sample of an artificially prepared mixture just ready to go to the molds in one of the large eastern factories was analyzed with the following results:

	Per Cent
Silica	69.03
Alumina	23.89
Iron oxide	0.45
Calcium oxide	0.29
Magnesia	0.05
Loss on ignition	7.46

A sample of North Dakota earthenware clay as dug gave the following:

	Per Cent
Silica	70.27
Alumina	20.81
Iron oxide	0.33
Calcium oxide	0.23
Magnesia	0.26
Loss on ignition	6.38

By comparing this and many other analyses with the analysis of the prepared mixture as taken from the pottery it will appear that there is a marked similarity in composition.

Work of testing these clays has invariably been started with a chemical analysis. After having selected the clays for various purposes as indicated by the chemical analyses and physical tests, the raw material was worked into various small dishes which were burned in the kilns at the school of mines. In a great number of tests made on these high grade clays there were very few which did not prove by practical work fully as good as was expected from the chemical and physical tests. In the large number of clays thus selected as suitable for the various purposes we have had but very few unsatisfactory results. In most cases the clays were plastic, showed only reasonable shrinkage, no trouble from checking in dry-

Dishes Made from North Dakota Clay
by School of Mines Students.

ing or burning. The color was remarkably good without even washing the clays and the bisque took the glaze very satisfactorily.

The white earthenware which have been made at the school of mines included the following products:

Bisque of cups and saucers, vases, small pitchers, ornamental dishes, small tiles, etc.

Several samples of clay of this grade were sent to eastern potteries and made up into a variety of different kinds of ware. The resulting products were of most excellent character and were highly spoken of by the men who did the work in the potteries.

The accompanying illustration will give an idea of some of the tests made of North Dakota earthenware clays.

The results of these investigations are very encouraging and we believe that such work will eventually sufficiently demonstrate the value of these clays to cause considerable development of the industry. Further details relative to the clays may be secured from a bulletin now in preparation on "Practical Tests of North Dakota Clays."

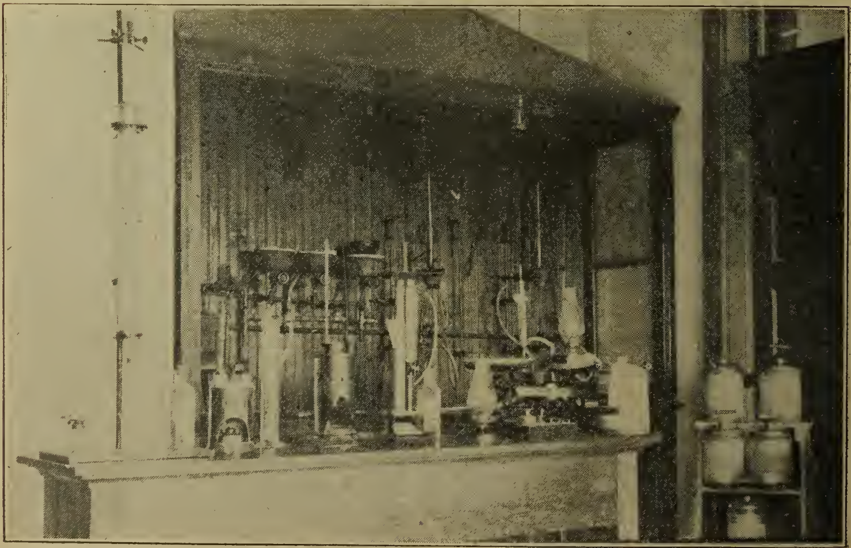
Art Pottery Made from North Dakota Clay

INVESTIGATIONS OF KEROSENE.

As provided by the state oil inspection law it becomes my duty to carry on special and technical investigations relative to the oils marketed in this state. During the past two years there has been a large amount of such work done for the state oil inspection. The detailed results of these analyses and tests are from time to time reported to the state oil inspector. The work of this department on oils is far too voluminous to enter upon in this summary of the work of the school of mines testing department. The law requires analytical work and various tests. A very large number of these have been made in the regular oil inspection work, but beyond this the importance of a thorough knowledge of the character and quality of the oils used in this state has seemed so evident that we have extended the lines of investigation, here, far beyond that required by the oil inspection. Inasmuch as keronsene or petroleum oil is strictly a mineral product it is the natural function of the school of mines to give considerable attention, not only to petroleum production, but as well to such investigations and to the laws regulating the quality of the oils marketed in this state.

The department of physics under the direction of Dr. George W. Stewart, has not only carried on the photometric tests required by the law, but has also extended this field of investigation. Dr. Stewart has devoted considerable time and skill to original resarch in connection with the physical properties of kerosene. The results of these investigations, which are somewhat technical in nature, promise to be valuable and practical contributions to our knowledge of the properties of kerosene oil, and they will be published later.

The analyses and tests carried on by the college of mining engineering and department of chemistry have served as a constant source of information as to the character and safety of the oils marketed in this state. Although a good deal of oil has come into the state which does not in all details meet the rigid requirements of our law, still the work of this department has no doubt aided materially in keeping up the quality of the oil supplied. As a result of all the analyses and tests it is quite evident that the oils from the different companies vary considerably. None of the companies always supply oil of the same uniform character. The weak points, however, are common to all companies. The inspection is serving, not only as a protection to the people, but it is also an aid in stimulating the producers to improve the quality of the oils furnished. A more detailed discussion of this work on oils will be furnished in a separate bulletin of the college of mining engineering.



Oil Testing Laboratory

CHEMICAL EXAMINATIONS OF WATER.

One of the most important matters for the consideration of any community is the quality of its water supply. Few people have a proper conception of the importance of a pure water supply, not only for domestic purposes, but also for industrial uses. A large amount of work has been done in this department in connection with the chemical examination of water used for both domestic and industrial purposes. In many cases the waters were found wholly unfit for industrial uses and also many of the samples coming from artesian and deep wells were too strongly impregnated with mineral matter to be used constantly for drinking purposes. In other cases the sanitary chemical analyses revealed frequent surface contaminations especially in the case of shollow wells. It is impossible in their brief outline of work to give results of the very large number of water analyses made.

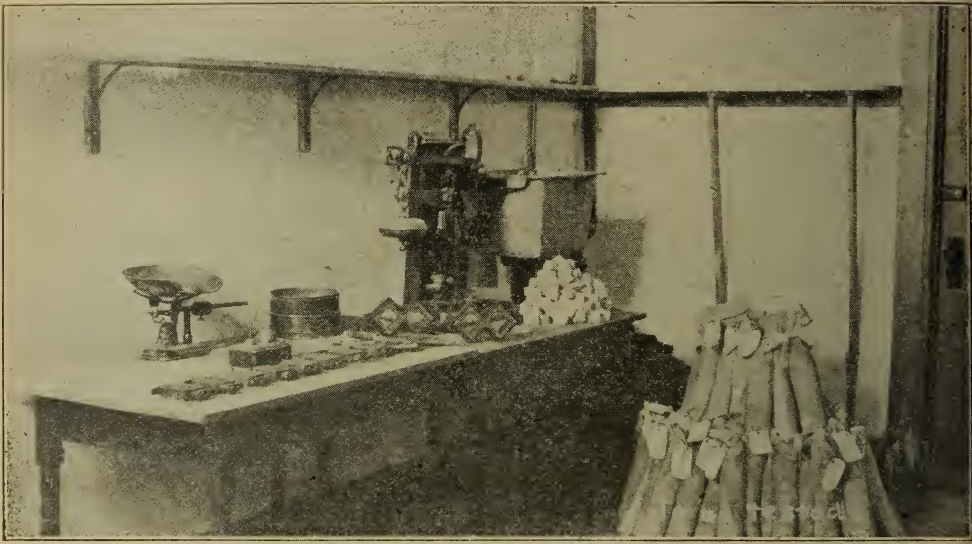
More care should be given to both the sanitary conditions of drinking water and the character of the water used for boilers in farm and stationary engines.

Few subjects need more attention or are more worthy of thought than this one of water supplies. Upon it to a great extent depends the health, comfort and prosperity of the whole community. It is to be hoped that with the advance in material progress our citizens will be better able to give more study, not only to economic husbandry and the development of our industries and natural resources, but as well to rendering thoroughly sanitary the sourroundings of the home, the school and the place of business. In all such efforts the department of chemistry and the college of mining engineering of the University of North Dakota may always be counted on for active support.

BUILDING MATERIALS.

The rapid development of our cities and towns and the more substantial character of our buildings, paving, systems of water supply, sewers, etc., have required a high grade of building materials. This has resulted in a need of more careful examinations of various kinds of building materials. During the past two years the college of mining engineering has made about 200 determinations and tests of various kinds of building materials such as stone, brick, plaster, cement and paving materials.

Besides the specific problems of investigation which I have mentioned already in this outline, there have been a great number of determinations made upon a variety of different problems too numrous to list separately, making a total of all kinds of determinations of probably betwen 1200 and 1800. This work is of a practical character and has, no doubt, been of great service to the people of the state. The college of mining engineering and the department of chemistry of the State University should be the natural place to



Cement Testing Laboratory

which the people of the state should come for the solution of all problems connected with the growth and development of our mining and allied manufacturing industries and for a solution of a variety of problems which are constantly presenting themselves to individuals and to communities.

To carry on all of this work in a reasonable manner demands further equipment for this testing department. It is therefore again strongly recommended that the sum of $18,000 be appropriated for the equipment and prosecution of the work of these testing laboratories of the college of mining engineering. It is hard to see how a more practical and important line of work could be built up and it is certain that every dollar expended in such work as is taken up by this testing department in these laboratories, would bring back to the state many fold in the saving of wasted resources, in the development of many industries and in the discovery and utilization of new factors in our industrial development.

Very respectfully,
E. J. Babcock,
Dean College of Mining Engineering.

REPORT OF THE COLLEGE OF MECHANICAL AND ELECTRICAL ENGINEERING

To the President of the University:

Sir: I have the honor to submit herewith my report of the college of mechanical and electrical engineering for the biennial period ending June 30, 1908.

The growth of the college has been steady since its establishment in 1901. During the past year thirty-one students were regularly enrolled and sixty-eight from other colleges of the University have taken from one to three of the technical courses offered in the college. Approximately forty-four per cent of the male students of the University of college grade exclusive of the law have been served by the college of mechanical and electrical engineering during the past year, and in many cases a large part of the year's work has been taken in the technical courses given in this college.

The action of the faculty permitting students in the liberal arts college to offer toward the B. A. degree, eight of the courses required of all mechanical and electrical engineering students, has had the desired effect of inducing them to spend more than four years in the University. By this arrangement a student may obtain his engineering degree in four years and by spending from one to two additional years, take work in English, history, political science, sociology, and other of the so called cultural courses and in this way lay a broad foundation for his engineering career and incidentally gain the B. A. degree.

Students are encouraged to do this whenever conditions warrant, for it is believed that the engineer should be more than a specialist, that he should have a broad outlook upon life and a literary as well as a scientific training. The plan seems to be working well. Three of the graduates of this college have held the degree of B. A. and four of our present students have planned their work in the expectation of taking both the engineering and B. A. degree.

GRADUATES.

If the question as to whether a college is fulfilling its mission is to be determined by the success of its graduates, then there is no doubt but what this college is fulfilling its mission in the educational regime of this state, for they have met with unqualified success in whatever branch of engineering they have entered, and the branches are diversified. Three of our graduates have been admitted for graduate work, free of all conditions, into one of the greatest engineering schools of the country. Two of the three have received appointments as instructors and are giving entire satisfaction. Another from this year's graduating class has also received an appointment as instructor at the same institution.

In other lines, the graduates have been no less successful, filling responsible positions with some of the greatest industrial and engineering firms in the country. Others have located in North Dakota and entered the field of constructional engineering. Some are operating electric lighting plants, while others are managing an electric street railway, and a large cement industry, and have about completed a steam railway connecting their cement plant at Concrete, North Dakota, with the Great Northern system at Edinburg, North Dakota, a distance of twenty-one miles. That the college is fulfilling its mission in fitting men to serve the state in the development of its resources, is shown by the activity of its graduates.

The graduates of the college are eagerly sought after by prominent engineering firms in various parts of the country. These requests are far more numerous than are our graduates, which tends to show that the college has a reputation without, as well as within, the borders of the state.

The aim of the college has been to lay a broad foundation for the engineering career of its graduates, rather than to encourage specialization on their part. The industrial life of the state other than that of agriculture and allied branches is but just beginning to develop or is yet to be developed. As the cities grow, there is going to be a greater and greater demand for men to manage such enterprises as gas, electric lighting and power plants, pumping and water filtration plants, as well as various kinds of manufacturing industries. There will be more and more calls for municipal engineers. The aim of the college is to give its graduates such a training as will enable them to meet with success in whatever field they may enter.

The cities of the state are just beginning to learn that when in need of information or expert advice concerning proposed gas, electric lighting, paving, water works, water filtration, and sewer propositions, it is no longer necessary to go outside of the state for such advice.

It has been the policy of this college to be of the greatest possible assistance to the public. Cities are taking advantage of this privilege and are coming to this college for advice and assistance in connection with their paving, lighting, waterworks, and other engineering problems. Assistance involving considerable work has been frequently given without any charge whatever, and in all cases where charges are made, they are very moderate, the object being to make the college serve the public in all possible ways.

EQUIPMENT.

The equipment of the shops has not been increased since they were first established. At that time only one of each of the more important kinds of machinery was installed. This sufficed at first, but the classes are so large now that additional equipment should be provided or the efficiency of the instruction will be greatly impaired. During the past year we have been unable to accommodate all who have sought admission to the forge and machine shops and the capacity of the wood working shop equipment has been taxed to the limit. The foundry equipment is exceedingly limited, consisting only of sand, riddles, shovels, and a few patterns, the latter having been made by the students. This shop should be provided at once with a cupola that the students may get experience in mixing and handling molten metals. The departments of applied mathematics, mechanical drawing, machine design, and theoretical engineering should have models and books costing about $2,000. The department of experimental engineering, or the mechanical and dynamo laboratory, like the foundry, has never been adequately equipped. Much of its equipment consists of machines that have been discarded, but which have been repaired so as to serve our needs, and some of it has been made in the shop by the students. The small amounts it has been possible to save from the small annual appropriations to the college, have been invested in equipment for this department, but as such apparatus is very expensive, the four or five hundred dollars we have been able to put into it each year has not gone very far. Small dynamos have been secured and the cheapest kind of electrical measuring instruments purchased.

This department should be equipped with each of the principal types of dynamos, motors, transformers, electrical measuring instruments, and standardizing apparatus. It should also be provided with a suitable condensing steam engine with which to drive the machinery. Also dynamometers, pressure gauges, and instruments needed in conducting standard efficiency tests.

It should also be provided with a steam turbine, a type of engine rapidly coming into general use and a producer gas generator set for power purposes.

The following is a summary of the amounts needed to equip the college to do efficient work.

Shops	$ 3,500
Theoretical engineering, machine design, etc. ..	2,000
Experimental engineering	16,000
Total	$ 21,500

Anything less than these amounts will mean that the North Dakota youths will not be getting that to which they are entitled.

NEW BUILDING.

When the present mechanical engineering building was constructed, it was planned to meet the needs of the college for ten years. This it doubtless would have done but for the fact that since that time, much of the technical work given by this college has been required of the students in mining engineering and has also been made elective for students in the other colleges. The result is that nearly all portions of the building are taxed to their limit. It has reached the state where increased numbers would mean decrease in efficiency.

The present building is well suited for shop purposes, being plain, cheap in construction, and well lighted. A new building should be provided to take care of the work in mechanical drawing, machine design, applied mathematics, experimental and theoretical engineering, and all of the recitation room work.

Respectfully submitted,
CALVIN H. CROUCH, Dean.

REPORT OF THE COLLEGE OF LAW

To the President of the University:

SIR: On behalf of the law department of the University of North Dakota, I beg to submit the following biennial report:

During the last school year of 1907 and 1908 there were registered in the law school, eighty students, of these fifteen were registered in the night school. There are at the present time registered in the law school sixty-six students, all of whom are registered in the day classes. This is a larger number than was registered at this time last year, and as many as was registered during the whole of last year in the day school. The night school has been discontinued, because, though greatly appreciated by many, it involved work and expense, which were not commensurate with the results. There was also an added reason in the fact that the supreme court of the state has recently made a ruling to the effect that hereafter four years instead of three years night work will be required of all candidates for admission to the bar and be deemed the equivalent of the two years' day work generally required.

The work of the school is progressing favorably, though on account of the death of Messrs. J. H. Bosard and Robert M. Carothers and the inability of some of the practicing attorneys who lecture in the school, to devote the time necessary for this work, the burden of the work has been thrown on the permanent two and the school is undermanned. The time has in fact arrived when a new and permanent instructor should be employed.

At a recent meeting of the Bar association of the state, a resolution was adopted, favoring a four years' high school course as a pre-requisite to admission to the bar and the law school should add this to its requirements at any early date. It, however, at the present time leads rather than lags behind in the matter of legal education and the raising of the legal standards as it will only admit as candidates for its degree those who have a two years' high school course, or its equivalent, while under the present statute anybody, no matter how poorly prepared as far as preliminary work is concerned, may take the state bar examination. So in the near future the course should be extended to three years. The immediate result of these changes, however, will be a decrease in attendance and an increase in the cost of instruction and it will be necessary for the trustees to provide for these additional expenditures.

In the attendance of this school year, the junior and senior classes are about equal in size. The graduating class of last June numbered thirty-three and all of its members were successful in passing the state bar examination.

Respectfully submitted,
ANDREW A. BRUCE,

REPORT OF THE COLLEGE OF MEDICINE

University, Nov. 5, 1908.

To the President of the University:

SIR: I desire to submit the following report of the medical college of the State University for the past two years:

The most pronounced service rendered the state by this college during the past two years has been that of securing a state public health laboratory and securing an able director for the same. The bill creating this laboratory was conceived and framed by members of the medical college faculty. Dr. J. D. Taylor, in charge of pharmacology and materia medica, introduced the bill and secured its passage, and also the appropriation which made it possible for the administrative officers to secure an efficient director for this important state work. The excellent organization of the public health laboratory by the present able director is making the University a power in conserving the greatest commercial asset of the state—the health of the people.

The increased room secured for the medical college during the past year has relieved, to some extent, the severe congestion experienced during preceding years. However, further extensions should be provided at a very early date.

The employment of an authority in bacteriology and pathology and the ample equipment of that department insure as exacting and comprehensive training in these two subjects as can be secured in the best medical colleges of the country.

The department of histology and embryology has received additional equipment during the past two years, and is now offering work which receives favorable recognition in the best medical schools.

The recent provision for a special teacher in physiology relieves the instructor in anatomy of the strain hitherto experienced in trying to direct work in these two major medical subjects. This separation of the work in anatomy and physiology satisfies one of the urgent needs of the medical college.

The organization of the work in physiology, as a separate department, is being carried forward at present. The results will strengthen the curriculum and make full articulation with other medical colleges optional with this school.

A distinct gain for the University was the admission of the medical college to the Association of American Medical Colleges in 1907. This secured wide approval of our standards which must be high in order to conform to those of the Association of American Medical Colleges. One of the immediate results has been the acceptance of our work in leading eastern and western medical colleges, whither our students have gone for their junior and senior years in medicine.

The present requirements of sixteen one-year courses in high school subjects and eight one-year courses in academic subjects prior to unconditional admission to the medical studies of our first year has postponed the enrollment of students in first year medical branches, but has not diminished the number matriculating in this college. On the contrary, there has been a healthy growth in the enrollment during the past two years.

NEEDS.

The medical college should be in a separate building as soon as it is possible to secure funds for its erection. The work in anatomy makes it desirable to secure special quarters. The same situation exists in respect to several of the other departments. In view of the desirability of isolating much of the medical work from the other scientific work of the University, and also because such isolation would individualize and strengthen the medical college I earnestly recommend that a separate building be planned at an early date.

The medical college is cramped for funds at present. We need $2,000, as a minimum, for our annual equipment, material and literature. At present we are seriously handicapped by our straightened financial condition. I urgently request that the above minimum appropriation be made in order that we may carry forward our present instruction and make modest provision for growth in this college.

Respectfully submitted,

M. A. Brannon,

Dean.

REPORT OF THE LIBRARIAN

November 5, 1908.

To the President of the University:

SIR: I have the honor to submit herewith my report as librarian for the biennial period ending June 30, 1908:

Having but recently undertaken my present duties, I take pleasure in testifying to the excellent work of my predecessor, Mr. Strong, and to the good condition of the library. The library consists at present of the following number of volumes:

General collection (catalogued)	7,181
Cochrane collection	1,956
Scandinavian collection	1,971
Public documents	3,838
Periodicals (bound)	908
Miscellaneous (uncatalogued)	3,115
The law library	6,360
Uncatalogued books in the departmental library, about	1,000
Total	26,329

There have been added to the library during the past two years 3,020 volumes. Of these, 461 were contributions from individuals and various institutions. This does not include the public documents received from the national government. During the same time there has been spent for:

Books	$ 2,909.18
Periodicals	1,443.19
Binding	139.87
All other expenses	319.38
Making a total of	$4,212.22

Mr. Andrew Carnegie several years ago gave the University $30,000 for a library building. This building was completed in the summer of 1908. It is of dark brick, trimmed with stone and consists of two stories and a basement. The whole building with the exception of two class rooms is used for library purposes. The general arrangement of the main floor is with the delivery desk in the center, periodical and reference rooms, one on each side of the front part and the stack room at the rear. The periodical and reference rooms have oak book cases running around the walls and a handsome fire place in each, with the picture of President Merrifield, prsented by the class of 1907, hanging over one, and the bronze seal of the University presented by the class of 1908 over the other. The genuine attractiveness of these rooms seems to create a certain atmosphere which has a decided influence towards good order in the library. The only thing which jars on one's sensibilities is the furniture, which consists of tables and chairs of rather nondescript order. We hope that these can soon be replaced by ones which are more suitable.

The book stacks on this floor are of steel construction, and although there is only one story of stacks at present, still the building is planned so that three stories can be installed at any time. It will not be long until all three stories will be needed, and even now many books, which should be readily accessible to the students, are kept in the basement in a crowded and inconvenient arrangement.

The Cochrane collection occupies one of the rooms on the second floor. Judge Cochrane's picture hangs on the wall, and the room gives one the impression of a fine private library.

The Scandinavian and Icelandic collections were a gift to the University by Scandinavian and Icelandic citizens of the state. These books are greatly used and appreciated.

The collection of books on railroads for which James J. Hill gave the University $4,000, has not yet been completed, but a great deal of care has been exercised by the department of political economy in the selection of these books, and they now number more than 1,000 volumes.

There are also six departmental libraries, as follows:

Biology, geology, mechanical engineering, physics, school of mines, public health laboratory.

The law library is entirely uncatalogued and, such being the case, much valuable matter is practically unavailable and an unlimited amount of time is wasted in trying to use the library without the aid of a catalogue. It would seem that the cataloguing of the law library should not be longer delayed.

The staff of the library consists at present of the librarian, the cataloguer, and two students who work from two to three hours a day. This is practically the same as it was four years ago. During these same four years the University has had an unprecedented growth and, with the increase in the number of students, the greater has become the demand on the library. The present staff is entirely inadequate for the amount of work which is necessary for efficient service. Without another assistant, it will be impossible to maintain the standard which has been set for the library in the past and quite hopeless to attempt the cataloguing of the departmental and law libraries.

The library is at present open from 8:30 a. m. until 6 p. m. and from 2 to 5 p. m. on Sunday. It seems to me a great mistake for the library not to be open in the evening. That is the period of the day when the students have the best opportunity for uninterrupted study and the very time when they would use the library the most if they were given the opportunity. This could be arranged for at no great expense. A student assistant could be in charge from 6 to 10 p. m., and this would not cost more than $250 for the whole school year.

A liberal policy toward the library just at the present time will repay many fold. Because of lack of funds, many of the periodicals for which the library subscribes have accumulated for several years without binding. They can be of little use until they are bound. It is a conservative estimate that it will cost $500 to bind these. The rounding out of the general collection, the strengthening of the reference collection, the completing of incomplete sets of magazines, are things upon which money can be spent with advantage. At present the annual appropriation, exclusive of salaries of the librarian and cataloguer, is slightly less than $2,400 a year. During the past two years, after paying all other expenses, such as for equipment, supplies, periodicals, binding, etc., only about 1,300 volumes have been purchased. If for the next five years, 5,000 could be added each year, at the end of that time the University would have a library which would serve the undergraduates to good advantage, would enable graduate students to carry on their work here without being altoegther handicapped for lack of material and would certainly be a great aid to the faculty i nmaking their courses broader and more complete.

The standard of any University can well be judged by the status of its library, and the building up of a large collection of well selected books and the administering of these according to the best methods cannot fail to add to the usefulness of the whole University.

Very respectfully submitted,

CHARLES H. COMPTON,
Librarian.

REPORT OF THE STATE GEOLOGIST

University, N. D., Nov. 5, 1908.

To the President of the University:

SIR: I beg to submit herewith my report on the work of the North Dakota geological survey during the years 1907 and 1908.

The publication of the fourth biennial report of the survey on the clays of the state was delayed somewhat on account of the large number of analyses and tests made of the clays. It was thought that the value of the results obtained would more than compensate for the delay that was necessary in order that they might be incorporated in the report. The volume is the largest yet gotten out by the survey, containing 340 pages and a large number of illustrations and maps. Among the latter is a colored geological map of North Dakota, showing the distribution of the different rock formations and giving the location of the brick plants. On another map are located the high grade fire and pottery clays of the western part of the state, showing the outcrops and probable extent of the deposits. There has been a widespread demand for this report both from the clay men and others within the state, and also from geologists and other people in all parts of the country. Information regarding the valuable clay resources of North Dakota has thus been widely circulated and cannot fail to be of benefit to the state. Letters expressing appreciation of the volume and containing words of commendation for it have been received from leading geologists, including the former director of the United States geological survey, and the chief geologist of the Canadian geological survey.

It is the wish of the survey that its reports be employed as widely as possible in the schools in the teaching of physical geography and elementary geology. They are already coming into use in a number of the high schools where they are found helpful, especially in the study of the local geography and geology. The many illustrations show the topographical features and rock formations, and the reports describe the natural resources of the region. During the past year many hundreds of the reports of the survey were distributed to the larger schools through the co-operation of the county superintendents. On his request the volumes were sent to the superintendent and placed by him in those schools in which they would be of greatest service.

During the summer of 1907 the state geologist had charge of a United States geological survey party of five, having associated with him Mr. Carl D. Smith of the federal survey. Detailed work was carried on in the region between Medora and Wibaux, Montana, the area which was covered by the survey being twenty-four miles wide and lying on either side of the Northern Pacific railroad. Important discoveries were made regarding the number, extent and distribution of the coal beds, and much information gathered for a report on the region covered. This report is now being published in a bulletin of the United States geological survey, and the material which was secured will also be available for, and is being incorporated in, the forthcoming fifth biennial report of the state survey.

While we were camped near Medora we were fortunate in having with us for over a week Dr. F. H. Knowlton of the United States geological survey and Dr. A. C. Peale of the Smithsonian institution, who were spending the summer collecting fossils at many localities in North Dakota and other western states. The fossils which were collected will make it possible to determine the age of certain formations in the western part of the state, about which there has been some doubt.

Early in August a second party in the employ of the North Dakota geological survey was organized by the state geologist for the purpose of extending the field work beyond the limits of the area covered by the federal party. The later party worked west into Montana, and in accordance with an agreement previously made with the United States geological survey, I was grantd permission to turn the work over to another in order that the investigations might be continued within North Dakota, and additional material thus gathered for the state survey report. The party went south from Medora, following up the Little Missouri river as far as the southern boundary of Billings county. The different coal beds which outcrop in the bluffs bordering the valley and in the badlands on either side were carefully traced, their thickness and extent were noted, and their outcrops located on the map. On Little Beaver creek, in northwestern Bowman county, a large collection of fossil shells was made from the Pierre shale, and these were shipped to the University to add its geological collections. Several weeks previous to this a choice lot of fossil leaves from near Medora had been sent in, along with some very finely preserved fossil fish from the top of Sentinel butte.

From Little Beaver creek the party went northeast to Sand Creek post office and the Chalk buttes, where the interesting oligocene formation found in that vicinity was studied and mapped. It was in this formation on the Chalk buttes that the extinct three-toed horse and rhinoceras were discovered several years ago.

Some work was also done during the summer of 1907 in the northeastern part of the state by Mr. V. J. Melsted, who spent six weeks in a detailed study of the cement rock of the Pembina mountain region. Careful search in the deep ravines and valleys of these mountains, often in the thick and tangled underbrush of that district, resulted in the discovery of many outcrops of the cement beds, which were located on the map. Samples from several localities were collected for analysis and considerable information gathered for a report on the cement materials of North Dakota. During the summer the state geologist made a trip to the Pembina mountains where several days were spent in going over some of the ground in company with Mr. Melsted.

During the field season of 1908 the North Dakota geological survey carried on work in the eastern and western portions of the state. In the western region the detailed investigations of the coal beds was continued and extended so as to cover those portions of Billings county not already visited or which had not yet been completed. The party, which was in charge of the state geologist, started from Dickinson and went northwest, striking the Little Missouri river at the Short ranch, near the mouth of Ash creek, about twenty-five miles north of Medora. From this point the river was followed down to the mouth of Beaver creek, at the northern boundary of Billings county; then Beaver creek was followed up as far as the Montana line. A large number of coal beds were found outcropping along the deep valley of Beaver creek, and there was much evidence to show that this area is rich in coal. The party now went south through Sentinel Butte to Yule, spending several days in the vicinity of Bullion butte on the way, and then on to the mouth of Bacon creek near the new town of Marmarth. After completing the work in the southern part of the county we spent a week in the badlands lying east of the Little Missouri between the mouth of Sand creek and the Northern Pacific railroad, and another week in the northeastern corner of Billings county.

The material gathered during the past summer, together with that previously scured during several years of field work in the southwestern corner of the state, will be used in the preparation of a detailed report on the geology and coal deposits of that section of North Dakota. This region was selected for detailed study because of the excellent opportunity afforded in the Little Missouri badlands for the examination of the coal beds, where these are so well exposed in numerous outcrops.

A very brief statement of some of the more important results of the field work during the season of 1908 may be given here. It was found that no less than twenty-one workable coal beds are present in Billings county alone, not all of them occurring at any one point, but some being found in one locality and some in another. These twenty-one coal beds range from four to thirty-five feet in thickness, and are distributed through from 1,000 to 1,200 feet of strata. The total thickness of the coal in these seams is 157 feet.

Some of the individual coal beds cover large areas. One, with a thickness varying from five to sixteen feet, has a known extent of twenty miles in one direction and twenty-five miles in another, with an area of at least 500 square miles and probably much greater. Another seam of coal was traced thirty-six miles north and south and twenty-four miles east and west, and while its known area as shown from outcrops is nearly 900 square miles, it undoubtedly has an extent of 1,000 to 1,500 square miles. This coal bed, with a thickness ranging from nine to fifteen feet and over, has been largely burned out or removed by erosion, but it still underlies a number of townships. At least half a dozen coal beds were discovered which were not before known to occur. The lowest coal seams in the geological column, and therefore the oldest, are those found in the vicinity of Yule, in southern Billings county. The highest and youngest are those which appear in Sentinel Butte and in the northeastern part of the county.

The discovery of the large fossil bones of the enormous land reptiles known as dinosaurs, was another important result of the summer's field work. These were found in the badlands, a few miles from the town of Marmarth, and several large boxes of them were shipped to the University to add to its collections. Many of these huge bones were buried in the clays of the region, and some had been washed out and were lying on the surface. This discovery is of increased interest owing to the fact that these fossil bones will make it possible to determine the geological age of the strata in which the fossils occur, the age of the formation having been in doubt up to the present time.

The work in the eastern part of the state was in charge of the assistant state geologist, Mr. John G, Barry, a graduate of the Massachusetts Institute of Technology. It consisted in the mapping of the geological formations of Pembina, Cavalier and adjoining counties, and the investigation of their natural resources. It was found that the northeastern part of North Dakota can be divided, on the basis of its topographic features, into three distinct districts, namely: the Red River valley; the deeply dissected Pembina mountains bordering the valley on the west, and the high rolling prairie which forms the greater part of Cavalier county.

The natural resources of the region consist of clay shales suitable for making excellent brick, cement rock, sand and gravel. The more extensive deposits of gravel and sand were located on the map wherever they were exposed at the surface, and in this way the localities where these occur were recorded. Much additional material regarding the cement rock was gathered, and together with that secured the year previous by Mr. V. J. Melsted, will be used as the basis for a report on the cement resources of North Dakota.

Early in September Mr. Barry made a trip to the gas field of Bottineau county for the purpose of investigating the gas wells of that region. Information was secured in regard to the depth, pressure, number and location of wells, and other features of the district. The productive area at present appears to be confined largely to the vicinity of the Parker farm, nine and one-half miles south of Westhope. The depth below the surface of the gas bearing sand varies from 160 to 240 feet, and it doubtless lies at or near the base of the glacial drift. This sand layer has a thickness of about twenty feet. prospecting is now going on with the hope of striking deep seated and more extensive reservoirs of gas, and one well is down about 1,200 feet. The pressure is reported to be sufficient to blow off at least 2,000,000 cubic feet per day. Experience in other states shows that these comparatively shallow drift wells have not yielded a very lasting supply, the reservoirs being of no great extent. But further prospecting at greater depths is warranted by the possibility that deeper reservoirs may exist in the region. Gas is also reported about six miles northwest of Mohall, where several wells have been sunk.

During the past year several papers and articles by the state geologist has been publishd, as follows:

"Coal Fields of Dawson, Rosebud and Custer Counties, Montana," which appears in Bulletin No. 316 of the United States geological survey.

"The Sentinel Butte Lignite Feld" which appears in Bulletin No. 341 of the federal survey.

Two articles, one on cement and another on coal in North Dakota, are contained in the annual volume, "Mineral Industry, 1907."

In May of this year I attended a conference of the state geologists, which convened in Washington, D. C. The gathering was held at the invitation of the director of the United States geological survey, for the purpose of arranging plans for co-operation between the federal and state surveys, and to plan the season's work so that there should be as little duplication as possible. The North Dakota geological survey has been co-operating with the United States geological survey for several years, and arrangements were made to continue this along several lines, as in the gathering of statistics of the production of coal, clay products, etc., and in the collection of well records, the federal survey bearing all the expense of this work. This conference afforded an opportunity for meeting and discussing with the government geologists various problems encountered in connection with the geology of this region, and was of distinct benefit to the work of the state geological survey.

In its work during the next few years the geological survey plans to continue the detailed investigations of the coal, clay and cement deposits of the state. These resources are increasing in value and importance with the rapid growth in population, and their proper development will be hastened and assisted by the information supplied by the state geological survey in its reports.

In this connection it is interesting to know that a recent estimate by one of the coal experts of the federal survey credits North Dakota with having more coal than any other state in the Union, and few people realize what this mineral wealth means to the state.

Another important line of investigation which the geological survey has taken up and will devote much attention to during the next few years, is the problem of underground water. Well records from all over the state are being collected through the co-operation of well drillers and others, and these will furnish the data from which it will be possible to tell approximately at what depth artesian and other waters may be struck in any part of the region.

As in past years, certain areas such as a county or several counties will be selected for detailed study, the geology and economic resources will be investigated, the rock formations mapped, and the material thus secured will be used in the preparation of reports on those districts.

A subject of the greatest practical importance to the people of the state is that of good roads, and one of the problems connected with this is where to find the materials for the construction of such roads. It is known that in various localities over our state there are extensive deposits of gravel and sand which are suitable for road metal. As soon as the funds are available the state geological survey will undertake the investigation of these road materials, including the location and mapping of such deposits, but it cannot be done on the present small appropriation received for the work of the survey. It is also exceedingly desirable that the topographic mapping by the United States geological survey should be continued and pushed in this state in order that the excellent relief maps published by the federal survey may include other areas in North Dakota. Many of the states, appreciating the great value of these maps, are appropriating large sums for this work and are thus co-operating with the United States geological survey. The latter organization does all the work of preparing the maps and publishes them; all that is asked of the state being that it shall bear half of the expense of the field work only. So far as it is able, the federal survey will put in a dollar for every dollar appropriated by the state. For two years the United States geological survey has done no topographic mapping in North Dakota, and if any more work of this kind is undertaken in this region the appropriation for the state geological survey will have to be largely increased, so that several thousand dollars can be set aside for this purpose. Whether the state survey can undertake in the near future more than one or two of the lines of investigation outlined above will also depend on whether the present small appropriation is substantially increased. There is no state in the Union that gives its geological survey so small an amount as does North Dakota; even the new state of Oklahoma gives its recently established survey fifteen times as much.

The North Dakota geological survey is acquiring by exchange for its publications an excellent geological library made up of the reports of the federal and various state surveys, as well as the reports of a number of similar organizations in foreign countries.

The forthcoming fifth biennial report of the survey will contain the following papers:

"Mineral Production of North Dakota for 1907."

"Natural Gas in North Dakota."

"The Geology of Southwestern North Dakota With Special Reference to the Coal."

"The Geology of Northeastern North Dakota With Special Reference to the Cement Rock."

The report will also contain a chapter treating in a popular way the geology of North Dakota, intended particularly for the use of the schools.

Respectfully submitted,
A. G. LEONARD,
State Geologist.

PEPORT OF THE PUBLIC HEALTH LABORATORY

University, N. D., Nov. 5, 1908.

To the President of the University:

ORGANIZATION OF THE PUBLIC HEALTH LABORATORY.

SIR: In accordance with an act of the tenth legislative assembly, there was established a state public health laboratory at the State University of North Dakota located at Grand Forks. The legislature also appropriated the sums of $2,000 for equipment and $5,000 annually for the maintenance of said laboratory, the purpose of which laboratory shall be "to make bacteriological examinations of bodily excretions, waters and foods; and make preparations and examinations of pathological tissues submitted by the state superintendent of public health, or by any county superintendent of public health, or by any regularly licensed physician of North Dakota."

The laboratory was opened under the present directorship on July 1st, 1907, and steps were taken immediately toward equipping the laboratory with the necessary apparatus and providing receptacles for the transmission of specimens for examination. As the mailing cans for these receptacles, and the apparatus, had to be gotten from New York, there was necessarily a delay of a number of weeks before the receptacles could be distributed. In the meantime a small number of specimens came in and were examined with the apparatus at hand. Early in August, 1907, the following letter circular was sent to every physician in Norfth Dakota, whose name and address were available:

DEAR DOCTOR: The State Public Health Laboratory which is conducted in connection with the Department of Bacteriology and Pathology in the College of Medicine of the University of North Dakota is now ready to make the following forms of laboratory diagnosis, free of charge for physicians practicing medicine in the state of North Dakota:

1. Bacteriological examinations of throat cultures for the presence of diphtheria bacilli.
2. Microscopic examinations of sputum for the presence of tubercle bacilli.
3. Microscopic examinations of purulent discharges from the eyes, urethra or vagina for the presence of gonococci. For this purpose two smears on glass slides should be made.
4. Widal tests to aid in the diagnosis of typhoid fever.

5. Bacteriological examinations of public water supplies when contamination is suspected. When water examinations are desired the physician should correspond with the laboratory before the sample is sent in.

6. Microscopic examination and diagnosis of pathological tissues removed at operation. Tissues may be fixed in 10 per cent formalin solution and sent to the laboratory in sputum jars (after throwing out the carbolic acid), which are provided by the laboratory.

7. Examination of urine and gastric contents.

8. Examination of material (the brain) from animals supposed to be affected with rabies. For this purpose the entire head of the dog or cat should be sent in as fresh as possible.

9. Examination of pus and other material from horses and cattle for the diagnosis of glanders and anthrax.

The laboratory has on hand a supply of packages for collecting and transporting throat cultures and sputum for examination at the laboratory, and for collecting and sending blood for the Widal test. These packages are sent to the physicians free of charge upon request to the laboratory. If you wish to keep the packages on hand ready for use at any moment kindly request the laboratory to send them to you. They will be sent to you by express, *charges collect.* Packages can be returned to the laboratory for examination of material by dropping them into the mail, postage prepaid.

Reports of examinations of throat cultures, sputum and of purulent discharges, and of the Widal test will usually be made within 24 hours after the material reaches the laboratory. Other reports are made as early as the nature of the case permits. Reports will usually be sent by mail, but upon request by the attending physician will be sent by telegraph, *charges collect.*

G. F. RUEDIGER,
Director.

In response to this letter requests for the receptacles were received from seventy physicians in different parts of the state. The receptacles were not quite ready for distribution, but all of these requests were filled during the month of September. Since that time 128 additional requests have been received and filled, so that there are at present 198 physicians in North Dakota who have on hand receptacles supplied by this laboratory. A large number of these have used from four to eight shipments of the containers, while a small number have not been heard from since the first supply was sent to them. These containers cannot be bought on the market, ready for distribution, but must be put up at the laboratory, under the supervision of a trained bacteriologist. They are so constructed that they may be sent through the mail as first-class matter.

DIPHTHERIA OUTFITS.

The diphtheria outfits are composed of an ordinary paper mache mailing tube, six inches long and one and three-quarter inches in diameter, inside of which is placed a tin can of proper size and good construction. Inside of the tin can are placed a test tube containing sterile, coagulated blood serum and another tube containing sterile cotton swab on a wire. A data card calling for the following points of information from the doctor accompanies every outfit:

STATE PUBLIC HEALTH LABORATORY
University of North Dakota College of Medicine
University, N. D.

Please fill out blank in full and send to laboratory with culture.

Patient's name .... Address ....
Physician's name .... Address ....
Health officer's name .... Address ....
Has this case been reported before?........ When................
Patient's age........ Sex............ Temperature.............
Date of earliest symptoms .... Date of taking culture........
Is membrane present ....Where
nares, pharynx.....
tonsils, larynx......

Has antitoxin been used?...... When........ Amount..........
Has antiseptic been used within two hours in mouth or throat?......
For diagnosis or release ....
Report by telephone
telegraph (collect)
mail

The reverse side of the card calls for the results of the laboratory examination, as shown below:

DIPTHERIA.

To be filled out at the laboratory.

Examination number ....
Date received ....
Examined ....
Result:
Type of bacillus in culture.
Associated bacilli.
Remarks ....
....
Reported by telephone
telegraph By ....Date..............
mail

Double walled containers are used to permit the sending of these specimens through the mail, which is unlawful if the swab is simply put into a test tube and then placed into a paste board, or wooden box. In some states the specimens are sent by express, but this is less convenient than where they are sent by mail. Our specimens are sent direct to the University where mail is received from the north, east, south and west every morning and evening. Cultures coming in the morning mail are incubated about half past nine a. m., and examined about 5 o'clock in the afternoon. If the result is positive for diphtheria the report is sent at once, but if it is negative the report is often withheld until the next morning, unless there is a good growth at the time the first examination is made. In that case the negative report is sent on the evening of the day the culture arrives, but the latter is examined again the following morning. Cultures arriving in the evening mail which reaches the University about 8 o'clock p. m., are looked after by a student and placed in the incubator so that they are ready for examination the following morning. The results of all examinations are recorded on the backs of the data cards which accompany the containers and are then filed away. An additional record is kept of all examinations in a book made for this purpose. Examinations of throat culture and of blood for the diagnosis of typhoid are made on Sundays as well as on other days, but sputums are not examined on Sunday.

SPUTUM OUTFITS.

Sputum outfits for the diagnosis of tuberculosis consist of heavy paper mache tubes four inches long by two inches in diameter, and containing a heavy tube-shaped vial in which is placed a small quantity of carbolic acid solutoin to disinfect the sputum. Accompanying each outfit is a data card calling for certain information from the doctor, and on the reverse side for the results of the laboratory examination, as shown in the reproduction.

STATE PUBLIC HEALTH LABORATORY
University of North Dakota College of Medicine
University, N. D.

Please fill out in full and send to laboratory with sputum.
Patient's name .... Address ....
Physician's name .... Address ....
Health officer's name .... Address ....
This is the 1st, 2d 3d specimen discharged during......Date..........
Have tubercle bacilli been found?........... When.............
Is patient coughing?.................... Expectorating.........
How long ill? .... Probable clinical diagnosis......

Report by telephone
telegraph (collect)
mail

TUBERCULOSIS.

To be filled out at the laboratory.

Examination number ....
Date received ....
Examined ....
Result:
Remarks ....
....

Reported by telephone
telegraph By ....Date.............
mail

Blood specimens for the diagnosis of typhoid fever are submitted on small pieces of aluminum foil, two inches square, which are sent out in envelopes, accompanied by a data card of the following construction:

STATE PUBLIC HEALTH LABORATORY
University of North Dakota College of Medicine
University, N. D.

Please fill out blank in full and send to laboratory with dried blood.
Patient's name .... Address ....
Physician's name .... Address ....
Health officer's name .... Address ....
Has this case been reported before?........ When...............
Patient's age........ Sex........... Temperature.............
How long since disease commenced?....Date of taking specimen....
Supposed source of infection....................................
Has patient been away during month previous to illness?...........
When, if ever before, has patient had typhoid fever?.................
Clinical diagnosis ....
telephone
Report by telegraph (collect)
mail

TYPHOID FEVER.

To be filled out at the laboratory.

Examination number ....
Date received ....
Examined ....
Age of culture ....Strain....................
Dilution ....Agglutination...........Time...........
Remarks ....
....
telephone
Reported by telegraph By ....Date.............
mail

Pus outfits consist of two clean glass slides placed in a slide mailing case to prevent breakage. Accompanying these are two small, sterile cotton swabs in a small envelope and a data card calling for the following information:

STATE PUBLIC HEALTH LABORATORY
University of North Dakota College of Medicine
University, N. D.

OPHTHALMIA, PUS OR BLOOD.

Strike out all but correct one. To be filled out by physician.
Physician's name .... Address ....
Date .... Patient's name ....
Patient's address ....Age......Sex...........
Exact source of material ....
To be examined for ....
Probable clinical diagnosis ....

PUS AND BLOOD.

Examination number ....
Date received ....
Examined ....
Result:
Remarks ....
....
telephone
Reported by telegraph By ....Date.............
mail

About 3,500 of these receptacles were sent out to the following physicians between September 5th, 1907, and June 30th, 1908. No charge is made for the receptacles.

LIST OF NAMES AND ADDRESSES OF PHYSICIANS WHO HAVE BEEN SUPPLIED WITH RECEPTACLES FOR COLLECTING AND TRANSMITTING SPECIMENS FOR EXAMINATIONS AT THE LABORATORY.

Abplanalp, Ira, Ray, Williams county.
Almklov, L., Cooperstown, Griggs county.
Anderson, C. O., Willow City, Bottineau county.
Andersen, A. G., Hillsboro, Traill county.
Arnold, E. W., Medford, Walsh county.
Arzt, Phil G., Fingal, Barnes county.
Aylen, J. P., Sheldon, Ransom county.
Bachman, C. E., Fingal, Barnes county.
Baldwin, W. P., Casselton, Cass county.
Baldwin, L. B., Jamestown, Stutsman county.
Bannister, E. O., Columbus, Ward county.
Barker, E. E., Turtle Lake, McLean county.
Bartley, W. M., Sheyenne, Eddy county.
Barton, Ira, Sanborn, Barnes county.
Bates, W. H., Grand Forks, Grand Forks county.
Beek, R. H., Lakota, Nelson county.
Bell, David, Edinburg, Walsh county.
Bennett, C. E., Aneta, Nelson county.
Berg, S. A., Mayville, Traill county.
Bensen & Kearney, Glen Ullin, Morton county.
Blanchard, H. B., Sherwood, Ward county.
Bock, J. J., Edinburg, Walsh county.
Brimi, C. L., Cooperstown, Griggs county.
Brown, Dr., St. Thomas, Pembina county.
Burrows, F. N., Bathgate, Pembina county.
Burton, P. H., Fargo, Cass county.
Campbell, R. D., Grand Forks, Grand Forks county.
Canfield, H., Hatton, Traill county.
Carter, J. A., Warwick.
Chambers, C. L., Bismarck, Burleigh county.
Christensen, W., Lidgerowod, Richland county.
Church, R. J., Conway, Benson county.
Claybaugh, W. R., Rolette, Rolette county.
Collison, H. M., Rugby, Pierce county.
Coffin, S. D., Erie, Walsh county.
Countryman, J. E., Grafton, Walsh county.
Darland, F. L., Sawyer, Ward county.
Davies, J. S., Granville, McHenry county.

Dillon, Dr. R., Fargo, Cass county.
Dochterman, L. B., Williston, Williams county.
Donovan, E. I., Langdon, Cavalier county.
Drew, G. F., Crary, Ramsey county.
Duggan, F. J., Grand Forks, Grand Forks county.
Du Puy, R. G., Jamestown, Stutsman county.
Duncan, J. H., Hunter, Cass county.
Durnin, Charles, Westhope, Bottineau county.
Durnin, G. A., Russell, Bottineau county.
Ekern, A., Grand Forks, Grand Forks county.
Emauel, H. W., Milnor, Sargent county.
Engstad, J. E., Grand Forks, Grand Forks county.
Erickson, H. C., Towner, McHenry county.
Esler, J., Milton, Cavalier county.
Ferguson, S. M., Brocket, Ramsey county.
Field, A. B., Forest River, Walsh county.
Fisher, Stephen, Dickinson, Stark county.
Fish, H. G., Wheatland, Cass county.
Fisk, Dr., Carpio, Ward county.
Frankson, B., Rugby, Pierce county.
Furness, G. B., Mandan, Morton county.
Gerrish, W. A., Enderlin, Ransom county.
Gislason, G. J., Grand Forks, Grand Forks county.
Godfrey, W. H., Russell, Bottineau county.
Govenlock, Dr., Gardner, Cass county.
Grassick, James, Grand Forks, Grand Forks county.
Guest, A., Jamestown, Stutsman county.
Haagenson, E. C., Hilslboro, Traill county.
Halldorson, M. B., Souris, Bottineau county.
Halverson, L. H., Des Lacs, Ward county.
Harris, C. E., Pembina, Pembina county.
Healy, H. H., Grand Forks, Grand Forks county.
Heinzeroth, C. E., Turtle Lake, McLean county.
Hillis, A. E., LaMoure, LaMoure county.
Hoff, G. C., Sheldon, Ransom county.
Hobert, W. F., Sawyer, Ward county.
Hood, C. E., Drayton, Pembina county.
Hubbard, F. G., Cayuga, Sargent county.
Hyslin, E., Kindred, Cass county.
Ivers, M. N., Abercrombie, Richland county.
Iverson, L., Christine, Richland county.
Jacoby, W. K., Willow City, Bottineau county.
James, H. J., Bathgate, Pembina county.
Jelstrup, C., Neilsville (Minnesota).
Johns, John G., Hettinger, Hettinger county.
Joyce, M. T., Brinsmade, Benson county.

Kaufman, Carl, Wahpeton, Richland county.
Kearney, P. F., Glen Ullin, Morton county.
Kennedy, W. J., Enderlin, Ransom county.
Keys, M. J., Sherwood, Ward county.
King, W. W., Milnor, Sargent county.
King, F. J., St. Thomas, Pembina county.
King, C. J., McHenry, Foster county.
Kron, Dr., Kenmare, Ward county.
Laberge, P. U., Williston, Williams county.
LaMoure, H. A., Grafton, Walsh county.
LaRose, V. J., Mandan, Morton county.
Lancaster, Blake, Crosby, Williams county.
Law, H. W. F., Hannah, Cavalier county.
Le Bien, E. A., McHenry, Foster county.
Lemery, B. D., Inkster, Grand Forks county.
Limburg, A. M., Bowbells, Ward county.
Lindner, C., Wales, Cavalier county.
Loomis, Dr., Lidgerwood, Richland county.
Lord, B. E., Glenburn, Ward county.
Lund, A. B., Leeds, Benson county.
McCallum, Charles, Portal, Ward county.
McCannel, A. J., Minot, Ward county.
McClusky, O. W., Cleveland, Stutsman county.
McConnell, Frances, Valley City, Barnes county.
McDonald, A. L., Grand Forks, Grand Forks county.
McEssy, E., Lankin, Walsh county.
McIntyre, George, Mayville, Traill county.
McKay, A. R., Bottineau, Bottineau county.
McKay, C. A., Emerado, Grand Forks county.
McLean, N., Kenmare, Ward county.
McLean, R. M., Gilby, Grand Forks county.
McManus, W. F., Grand Forks, Grand Forks county.
McMurtry, W. C., Walford.
McReynolds, C. E., Goodrich, McLean county.
Martin, T. P., Towner, McHenry county.
Matchan, W. G., Bismarck, Burleigh county.
Meyers, L. W., Marion, LaMoure county.
Meidell, R., Aneta, Nelson county.
Miller, G. H., Stanley, Ward county.
Miller, H. W., Jamestown, Stutsman county.
Moeller, Thor, Minot, Ward county.
Moffat, George, Donnybrook, Ward county.
Morris, V. G., Schafer, Wallace county.
Mulligan, Thomas, Grand Forks, Grand Forks county.
Norris, Dr., Dickey, LaMoure county.
O'Keefe, H., Grand Forks, Grand Forks county.

Onsum, E., Devils Lake, Ramsey county.
Oyen, Per, Fessenden, Wells county.
Patterson, A. G., Lisbon, Ransom county.
Paulson, A. J., Flaxton, Ward county.
Peake & Peake, Valley City, Barnes county.
Pence, R. W., Minot, Ward county.
Perkins, G. A., Dickinson, Stark county.
Perrin, J. A., Antler, Bottineau county.
Peterson, G. E., Streeter, Stutsman county.
Platt, Dr., Granville, McHenry county.
Platou, L. S., Valley City, Barnes county.
Poole, C. V. B., York, Benson county.
Powell, Dr. Minnewaukon, Benson county.
Pray, E. A. Valley City, Barnes county.
Quain, E. P., Bismarck, Burleigh county.
Raineville, S., Tolley.
Ramstad, N. O., Bismarck, Burleigh county.
Rankin, James, Jamestown, Stutsman county.
Rasmusson, F. P., Kathryn, Barnes county.
Ray, R. H., Garrison, McLean county.
Ribble, G. B., LaMoure, LaMoure county.
Ritchie, Dr., Velva, McHenry county.
Roan, Dr., Bismarck, Burleigh county.
Roberts, F., Cando, Towner county.
Rollefson, C. I., Ambrose, Ward county.
Rowe, O. W., Towner, McHenry county.
Ryder, B. E., Oakes, Dickey county.
Sasse, E. G., Lidgerwood, Richland county.
Scanlan, W., Page, Cass county.
Schanche, H. S., Portland, Traill county.
Scott, W. B., Ray, Williams county.
Shields, N. J., Lidgerwood, Richland county.
Shortridge, W. R., Flasher, Morton county.
Sihler, W. F., Devils Lake, Ramsey county.
Smith, J. C., Thompson, Grand Forks county.
Smith, Sarah Ethel, Dickinson, Stark county.
Smyth, F. R., Bismarck, Burleigh county.
Sorenson, D. R., Barton, Pierce county.
Spicer, C. E., Litchville, Barnes county.
Stewart, M. A., Omemee, Bottineau county.
Stewart, Zella, Grand Forks, Grand Forks county.
Stevenson, John, Litchville, Barnes county.
Steeves, E. O., Berwick, McHenry county.
Stixrud, T. M., Litchville, Barnes county.
Stribling, J. W., Dickinson, Stark county.
Swenson, A. W., Bisbee, Towner county.

Taylor, John Duncan, Grand Forks, Grand Forks county.
Todd, G. D., Medina, Stutsman county.
Torland, A., Underwood, McLean county.
Trainer, M. E., Stanley, Ward county.
Truscott, J. R., Binford, Griggs county.
Van de Ever, H., Pingree, Stutsman county.
Van de Ever, W., Kensal, Stutsman county.
Waldren, H. M., Drayton, Pembina county.
Walker, J. J., Cavalier, Pembina county.
Ware, E. M., Lankin, Walsh county.
Warren, J. W., Leeds, Benson county.
Welch, W. H., Larimore, Grand Forks county.
Wendell, W. G., Courtenay, Ransom county.
Westley, M. D., Cooperstown, Griggs county.
Wheeler, H. M., Grand Forks, Grand Forks county.
White, William E., Mayville, Traill county.
White, S. G., Ambrose, Ward county.
Widmeyer, J. D., Rolla, Rolette county.
Wiigs, I. C. J., Kenmare, Ward county.
Williamson, G. M., Grand Forks, Grand Forks county.
Wink, H. K., Jamestown, Stutsman county.
Witherstine, W. H., Grand Forks, Grand Forks county.
Wolverton, W. C., Linton, Emmons county.
Woutout, H. G., Grand Forks, Grand Forks county.
Young, V. A., Hankinson, Richland county.

Some irregularities were naturally encountered in the collection and transmission of specimens, as a result of which the following letter circular was sent out April 1st, 1908:

CIRCULAR OF INFORMATION.

April 1, 1908.

DEAR DOCTOR:

The Public Health Laboratory has been running for nine months under the present organization, and a number of points have come up to which I wish to invite your attention.

(1) On and after May 1, 1908, specimens of sputum and throat cultures will not be examined at this laboratory unless they are submitted in containers provided for that purpose by this laboratory. This precaution has become necessary because some physicians are sending specimens in such a careless manner that the worker in the laboratory can no longer afford to take the risks which are connected with the examination of these specimens.

(2) The Laboratory has on hand a supply of containers for collecting and transporting throat cultures, sputum and pus smears for examination, and for collecting and sending blood for the Widal test. These containers are sent to the physicians free of charge upon request to the Laboratory. If you wish to keep the packages on hand ready for use at any moment kindly request the Laboratory to send them to you. They will be sent to you by express, *charges collect.* Packages can be returned to the laboratory for examination of material by dropping them into the mail, postage prepaid.

(3) Specimens for examination at the Laboratory should be directed to the "State Public Health Laboratory, University, N. D." The State University is outside the city limits of Grand Forks and there are both a postoffice and express office at the university called "University, N. Dak."

(4) Blood smears can be used only for a differential leucocyte count to aid in the diagnosis of leukemias and pernicious anemia. We cannot determine the number of leucocytes, nor the number of red corpuscles, per cubic millimeter, from a specimen of dried blood; neither can we determine the per cent of hemoglobin from the dried blood. These latter examinations cannot be made in a laboratory of this kind as it is impossible to get the fresh specimens of blood. In sending blood for the Widal test we frequently get specimens that are too small to use. Please send at least three or four good sized drops.

(5) Sputum can be examined only for tubercle bacilli. The examination of sputum for pneumococci is of very little value because it is now well known that these organisms are frequently found in the throat in great abundance in cases of pharyngitis and so-called "colds." They are also found in nearly all healthy throats although perhaps never in great abundance. We therefore cannot diagnose pneumonia on the finding of pneumococci in the sputum.

(6) Please fill out all data cards before sending in the specimens. These cards are kept here as permanent records and if properly filled out can be used for the compiling of statistics.

(7) Pathological tissues may be sent in the sputum jars, after pouring out the carbolic acid. They must not be placed in the carbolic acid but in 10 per cent formalin or in 70 per cent alcohol. Small pieces of tissue easily become dry and hard and must therefore be placed in some solution soon after removal. Dried tissues cannot be examined. Tissues must be accompanied by a brief clinical history of the patient.

GUSTAV F. RUEDIGER, M. D.,
Director

During the year ending June 30th, 1908, we have examined at the laboratory, and given reports on, 1,828 bacteriological and pathological specimens from all over the state. Seven hundred and eighty-seven of these were throat cultures to be examined for diphtheria bacilli. Of this number of throat cultures 379 were for release and 408 for diagnosis. One hundred and seventy-nine of the last mentioned lot were found to contain diphtheria bacilli and 229 did not contain them. There were 454 specimens of sputum examined for tubercle bacilli, 116 of which were positive. One hundred and ninety specimens of blood were tested for the typhoid reaction, 74 of which gave a positive reaction; 120 of the specimens were pieces of tissue which had been removed at operation. These tissues were examined to determine if they are from a malignant cancer or from one of the less dangerous tumors. In addition to these we examined 74 specimens of pus to identify the infecting microorganism, 40 specimens of water, 59 specimens of urine, 10 specimens of stomach contents, 8 dogs' heads, which were examined for rabies. The remainder were specimens of blood, faeces, milk and cream.

All reports are sent by mail, but when the case is urgent telegraphic or telephone reports precede the mail reports.

The specimens came from nearly every county in the state, as is shown by the following list of names and addresses of physicians who have made use of the laboratory during the year:

LIST OF NAMES AND ADDRESSES OF PHYSICIANS WHO MADE USE OF THE LABORATORY DURING THE FIRST OF THE YEAR.

Abplanalp, Ray, Williams county.
Almklov, L., Cooperstown, Bottineau county.
Anderson, C. O., Willow City, Bottineau county.
Andersen, A. G., Hillsboro, Traill county.
Arnold, E. W., Medford, Walsh county.
Arzt, Phil G., Fingal, Barnes county.
Aylen, James P., Sheldon, Ransom county.
Backman, C. E., Fingal, Barnes county.
Baldwin, W. P., Casselton, Cass county.
Bannister, I. O., Columbus, Ward county.
Barker, E. E., Turtle Lake, McLean county.
Bartley, W. M., Sheyenne, Eddy county.
Barton, Ira, Sanborn, Barnes county.
Bates, W. H., Grand Forks, Grand Forks county.
Beek, R. H., Lakota, Nelson county.
Bell, David, Edinburg, Walsh county.
Bennett, C. E., Aneta, Nelson county.
Belyea, E. H., Williston, Williams county.
Berg, S. A., Mayville, Traill county.
Benson & Kearney, Glen Ullin, Morton county.
Blanchard, H. B., Sherwood, Ward county.
Bock, J. J., Edinburg, Walsh county.
Brandt, A. M., Bismarck, Burleigh county.
Brimi, C. L., Cooperstown, Griggs county.
Brown, Dr., St. Thomas, Pembina county.
Burrows, F. N., Bathgate, Pembina county.
Burton, P. H., Fargo, Cass county.
Campbell, R. D., Grand Forks, Grand Forks county.
Canfield, H., Hatton, Traill county.
Carter, J. A., Warwick.
Chambers, C. L., Bismarck, Burleigh county.
Christensen, W., Lidgerwood, Richland county.
Church, R. J., Conway, Benson county.
Clark, I. D., Harvey, Wells county.
Claybaugh, W. R., Rolette, Rolette county.
Collison. H. M., Rugby, Pierce county.
Coffin, S. D., Erie, Walsh county.
Countryman, J. E., Grafton, Walsh county.
Dale, Capt. F. A., Fort Lincoln, Burleigh county.

Darland, F. L., Sawyer, Ward county.
Davies, J. S., Granville, McHenry county.
Devine, J. L., Lansford, Bottineau county.
Dillon, Dr., Fargo, Cass county.
Dochterman, L. B., Williston, Williams county.
Donovan. E. I., Langdon, Cavalier county.
Drew, G. F., Crary, Ramsey county.
Duggan, F. J., Grand Forks, Grand Forks county.
Du Puy, R. G., Jamestown, Stutsman county.
Duncan, J. H., Hunter, Cass county.
Dunn, J. C., Newburg, Bottineau county.
Durnin, Charles, Westhope, Bottineau county.
Durnin, G. A., Russell, Bottineau county.
Ekern, A., Grand Forks, Grand Forks county.
Emanuel H, W., Milnor, Sargent county.
Engstad, J. E., Grand Forks, Grand Forks county.
Erickson, H. C., Towner, McHenry county.
Esler, J., Milton, Cavalier county.
Fawcett, Dr., Grand Forks, Grand Forks county.
Ferguson, S. M., Brocket, Ramse ycounty.
Field, A. B., Forest River, Walsh county.
Fisher, Stephen, Dickinson, Stark county.
Fish, H. G., Wheatland, Cass county.
Fisk, Dr., Carpio, Ward county.
Folsom, E., Fargo, Cass county.
Foster, W. B., Bismarck, Burleigh county.
Frankson, B., Rugby, Pierce county.
Furness, G. B., Mandan, Morton county.
Gerrish, W. A., Enderlin, Ransom county.
Gibson, S. G., Landon, Cavalier county.
Gislason, G. J., Grand Forks, Grand Forks county.
Godfrey, W. H., Russell, Bottineau county.
Gwenlock, Dr., Gardner, Cass county.
Grassick, James, Grand Forks, Grand Forks county.
Guest, A., Jamestown, Stutsman county.
Haagenson, E. C., Hillsboro, Traill county.
Halldorson, M. B., Souris, Bottineau county.
Halverson, H. L., Des Lacs, Ward county.
Harris, C. B., Pembina, Pembina county.
Hattendorf, Jessie, Jamestown, Stutsman county.
Healy, H. H., Grand Forks, Grand Forks county.
Hedding, J. A., Hope, Steele county.
Heinzeroth, G. E., Turtle Lake, McLean county.
Hillis, A. E., LaMoure, LaMoure county.
Hoff, C. G., Sheldon, Ransom county.
Hobert, W. F., Sawyer, Ward county.

Hood, C. E., Drayton, Pembina county.
Horsman, A. T., Devils Lake, Ramsey county.
Hubbard, F. G., Cayuga, Sargent county.
Hyslin, E., Kindred, Cass county.
Householder, Dr., Minot, Ward county.
Jacoby, W. K., Willow City, Bottineau county.
James, H. J., Bathgate, Pembina county.
Jelstrup, C., Neilsville, Minnesota.
Johns, John G., Hettinger, Hettinger county.
Joyce, M. T., Brinsmade, Benson county.
Johns, S. M., Velva, McHenry county.
Kaugman, Carl, Wahpeton, Richland county.
Gearney, P. F., Glen Ullin, Morton county.
Kennedy, W. J., Enderlin, Ransom county.
Kennott, L. H., Minot, Ward county.
Keys, M. J., Sherwood, Ward county.
King, W. W., Milnor, Sargent county.
King, F. J., St. Thomas, Pembina county.
King, C. J., McHenry, Foster county.
Kron, D., Kenmare, Ward county.
Quain, E. P., Bismarck, Burleigh county.
Rainsville, S., Tolley.
Ramstad, N. O., Bismarck, Burleigh county.
Rankin, James, Jamestown, Stutsman county.
Ransom, E. M., Minot, Ward county.
Rasmussen, F. P., Kathryn, Barnes county.
Ray, R. H., Garrison, McLean county.
Ribble, G. B., LaMoure, LaMoure county.
Rice, P. F., Cannon Ball, Morton county.
Rings, Dr., Minot, Ward county.
Ritchie, Dr., Velva, McHenry county.
Roan, Dr., Bismarck, Burleigh county.
Roberts, F., Cando, Towner county.
Rollefson, C. I., Ambrose, Ward county.
Rowe, O. W., Towner, McHenry county.
Ryder, B. E., Oakes, Dickey county.
Solbreiter, Dr., Bismarck, Burleigh county.
Sasse, E. G., Lidgerwood, Richland county.
Scanlan, W., Page, Cass county.
Schanche, H. S., Portland, Traill county.
Scott, W. B., Ray, Williams county.
Shields, N. J., Lidgerwood, Richland county.
Shortridge, W. R., Flasher, Morton county.
Sifton, John, Jamestown, Stutsman county.
Sihler, W. F., Devils Lake, Ramsey county.
Smith, J. C., Thompson, Grand Forks county.

Smith, Sarah Ethel, Dickinson, Stark county.
Smyth, F. R., Bismarck, Burleigh county.
Sorenson, Dr., Barton, Pierce county.
Spicer, C. E., Litchville, Barnes county.
Steele, D. C., Fairmount, Richland county.
Stewart, M. A., Omemee, Bottineau county.
Stewart, Zella, Grand Forks, Grand Forks county.
Stevenson, John, Litchville, Barnes county.
Steeves, E. O., Berwick, McHenry county.
Stixrud, T. M., Litchville, Barnes county.
Stribling, J. W., Dickinson, Stark county.
Swenson, A. W., Bisbee, Towner county.
Taylor, John Duncan, Grand Forks, Grand Forks county.
Taylor, J. D., Minot. Ward county.
Titus, C. I., Minot, Ward county.
Todd, G. D., Medina, Stutsman county.
Torland, A., Underwood, McLean county.
Truscott, J. R., Binford, Griggs county.
Trainor, M. E., Stanley, Ward county.
Van de Ever, H., Pinyree, Stutsman county.
Van de Ever, W., Kensal, Stutsman county.
Wagar, W. D., Michigan, Nelson county.
Waldren, H.M.,Drayton . Pembina county.
Walker, J. J., Cavalier, Pembina county.
Ware, E. M., Lankin, Walsh county.
Warren, J. W., Leeds, Benson county.
Welch, W. H., Larimore, Grand Forks county.
Wendell, W. G., Courtenay, Ransom county.
Westley, M. D., Cooperstown, Grfiggs county.
Wheeler, H. M., Grand Forks, Grand Forks county.
White, William E., Mayville, Traill county.
White, S. G., Ambrose, Ward county.
Widmeyer, J. D., Rolla, Rolette county.
Wiigs, I. C. J., Kenmare, Ward county.
Williamson, G. M., Grand Forks, Grand Forks county.
Wink, H. K., Jamestown, Stutsman county.
Witherstine, W. H., Grand Forks, Grand Forks county.
Wolverton, W. C., Linton, Emmons county.
Woutat, H. G., Grand Forks, Grand Forks county.
Wright, Dr., Mohall, Ward county.
Young, V. A., Hankinson, Richland county.

PATRONAGE OF THE LABORATORY BY THE DIFFERENT COUNTIES OF THE STATE.

If we tabulate the examinations according to the counties from which the specimens were received the following result is obtained:

Counties.	No. of Specimens.
Adams	4
Barnes	40
Benson	27
Billings	0
Bottineau	57
Bowman	0
Burleigh	82
Cass	28
Cavalier	18
Dickey	10
Dunn	1
Eddy	3
Emmons	2
Foster	23
Grand Farks	410
Griggs	55
Hettinger	3
LaMoure	29
Logan	0
McHenry	45
McIntosh	0
McKenzie	0
McLean	9
Mercer	0
Morton	16
Nelson	25
Oliver	0
Pembina	23
Pierce	24
Ramsey	49
Ransom	61
Richland	84
Rolette	14
Sargent	19
Stark	13
Steele	1
Stutsman	350
Towner	6
Traill	44
Wallace	1
Walsh	46
Ward	115
Wells	4
Williams	34
Unclassified	34

Counties.	No. of Specimens.
Minnesota	5
South Dakota	3
Montana	2
Total	1,828

SANITARY WATER ANALYSIS.

Most of the water examinations made were bacteriological in character, but eight chemical examinations were made for us by Professor Babcock of the University of North Dakota. The laboratory accepts water for chemical analysis to determine whether or not it is suitable for drinking water, but at present these determinations are made for us by Professor Babcock. The laboratory pays him the nominal sum of $5.00 an examination for this work.

When pollution is suspected and an analysis is desired physicians are requested to write to the laboratory for a container and instructtions for collecting and sending the water. We have on hand a few zinc-lined boxes large enough for a piece of ice and containing a sterile bottle and a clean Mason fruit jar. These containers may be had for the sending of water, but must be returned promptly as we have only a small supply of them on hand.

We will not examine specimens of water that are not submitted in our containers, packed in ice.

It is commonly believed that it is an easy matter to isolate typhoid bacilli from a sample of water taken from a source that is supposed to be polluted with the excreta from typhoid fever patients. This is, however, not the case, but on the contrary, it is extremely rare that a bacteriologist succeeds in isolating these organisms from sewage polluted drinking water or river water. In the routine bacteriological examination of drinking water we do not base our conclusions upon the finding or failure to find of typhoid bacilli, but upon the number of colon bacilli and sewage streptococci contained in the water, and upon the total number of bacterial colonies that develop from each cubic centimeter of the water.

It is evident from these few remarks that it is very important that the water should be collected under the strictest precautions against the accidental introduction of colon bacilli or mouth streptococci. If these organisms are accidentally introduced in the collection of the sample, the bacteriological examination will necessarily be misleading and hence worse than worthless. For a chemical examination also it is very important that the containers in which the water is collected should be absolutely free from both organic and inorganic matter. Another very important point in this work is the length of time which has elapsed from the time of collecting the sample until it is analyzed. The committee on standard methods of water analysis of the American Public Health Association recommends that the bacteriological examination should always be made within six hours after collection, and the chemical examination within twenty-four hours after collection of the sample. This forbids the sending of water for great distances by express if a bacteriological examination is desired, but this time can be somewhat lengthened if the specimen is packed in ice, but it should never exceed twenty-four hours. If the specimens are to be sent by express they should always be packed in ice, and if the time of shipment requires more than twenty-four hours the laboratory will in the future endeavor to send a man to make the collection and inoculate the various culture media before he starts back to the laboratory. In this manner perfectly reliable analyses of drinking water can be made, but I wish to emphasize the fact that it is impossible to get reliable reports if such precautions are not taken, although many laboratories still make the examinations under all conditions.

BULLETINS.

One popular bulletin on "Sewage Disposal in Relation to Typhoid Fever" was issued in May, 1908. A copy of this bulletin is enclosed with this report. Two thousand five hundred copies of the bulletin were distributed.

G. F. RUEDIGER,
Director.

SEWAGE DISPOSAL IN RELATION TO TYPHOID FEVER.

INTRODUCTION.

Perhaps no subject is of greater fundamental importance to a community than the question of public health and sanitation, and yet we are safe in saying that few people know anything about this subject. This seems to be partly due to indifference on the part of the public, but in part also to a lack of opportunity to learn about this matter. One of the most important problems of this nature for North Dakota is that of sewage disposal and water supplies. The object of this paper is therefore to direct attention to the dangers and filthiness of the improper disposal of human and other excretal wastes of our inland cities and to discuss briefly the advances that have been made along this line in recent years. It is hoped also that a few practical lessons may be learned by every reader and that very soon the principals expounded will be put into active practice in this state as they have been in many of the eastern states.

In order that the following paragraphs may be more clearly understood by those who are not familiar with the science of bacteriology a few introductory remarks concerning the sizes and shapes of bacteria must here be made.

BACTERIA.

Bacteriology is the science that treats of the smallest known living things, i. e., bacteria. According to shape the bacteria may be divided into three great groups as follows: (1) the cocci or spherules; (2) the bacilli or rods and (3) the spirilla or corkscrew-shape organisms. The cocci form a large and important group, only a few of the common members of which need be mentioned here. They may appear as single cocci in the tissues of the body as is the case with the micrococcus of Malta fever. Instead of appearing singly we may find them grouped in pairs, which are spoken of as diplococci. The most important of the common diplococci is the pneumococcus, i. e., the bacterium which causes pneumonia. Another importatnt diplococcus is the organism which produces epidemic cerebro-spinal meningitis. A third grouping of the cocci is in the form of chains, or strings of beads. These are called streptococci, and they frequently cause what the laymen call "blood poisoning." "Blood poisoning" is therefore a microbic disease and is not produced by the absorption of a dead poison into the blood. It is the bacteria instead of a dead poison which gain entrance into the blood and produce there a powerful poison which is responsible for the alarming symptoms and often death. Finally we may have the cocci grouped in clusters like a bunch of grapes and these are called staphylococci. The staphylococci are the most common of the great group of cocci and are the most frequent producers of pus and boils. The bacilli or rod-shaped bacteria also form a large and important group, the most common of which are the bacillus of diphtheria, the bacillus of typhoid fever, the bacillus of tuberculosis, the bacillus of lock-jaw and the bacillus of influenza. As representatives of the group of spirilla we need mention only the spirillum of Asiatic cholera and the spirillum of recurrent fever.

All of these bacteria are far too small to be seen with the naked eye or even with an ordinary magnifying glass. In order to make them visible it is necessary to use a good compound microscope, magnifying at least 800 to 1000 diameters. The cocci do not often reach 1-25,000 of an inch in diameter and the bacilli are not very much larger. These bacteria all multiply by simple division of the cell which is the most rapid method of reproduction. In fact the multiplication of such bacteria as the typhoid bacillus is so rapid as to be almost incredible. Starting with a newly formed typhoid germ in a favorable culture medium and at a body temperature it takes only 30 minutes till it divides to form two daughter germs. That does not seem like a large number, but if each daughter germ keeps on dividing every half hour for 20 hours, at the end of that time we will have 57,537,462,272 typhoid germs formed from one original organism.

It is a well established and widely recognized fact that typhoid fever is a germ disease and that its prevalence in certain communities is in a large measure due to the improper disposal of human excreta, and especially the sewage of our cities. As long as the causative agent of a disease is not definitely known it is difficult for the sanitarian to successfully combat such a disease and to protect the community against infection. In the case of typhoid fever, however, we know that the disease is produced by the bacillus typhosus which was discovered by Eberth in 1880 and carefully studied in pure form by Gaffky in 1884. It is a short, plump, actively motile bacillus rarely exceeding 3-25,000 inch in length and never reaching 1-25,000 inch in thickness. It grows well in ordinary beef broth and may remain alive for days in ordinary drinking water and for more than two months in ice. We must not be led to believe that ice is free from disease-producing bacteria because is has been kept for some time at a temperature of 20 or 30 degrees below freezing. This temperature does not necessarily kill the bacteria and it has been proven that typhoid bacilli may remain alive in ice for more than two months. This does not mean, however, that the bacilli do not gradually die out in the ice, for it has been shown that most of them are dead in three months, but not all of them.

During an attack of typhoid fever the bacilli are found in great abundance in the bile, small intestines, spleen and mesenteric lymph glands of the patient, and in some periods of the the disease they are found also in the circulating blood. They are therefore excreted from the body in a living condition through the stools, the urine and frequently the sputum. It used to be thought that the stools are the only excreta which need to be disinfected, but more recently it has been learned that the sputum and especially the urine frequently contain the germs in great abundance. The number of living typhoid bacilli that may be excreted with the urine of a convalescing typhoid fever patient is almost beyond human comprehension. It has been estimated by one investigator that one of his patients discharged 5,000,000 of these organisms with every cubic centimeter of urine that was voided during convalescence. If this patient voided 1000 cubic centimeters of urine in 24 hours, he discharged 5,000,000,000 living typhoid bacilli every 24 hours, a very small fraction of which, if introduced rightly into the system of a healthy person, would produce the disease.

Having seen in what great abundance living typhoid bacilli are excreted by typhoid fever patients let us now inquire if experience has proven that this is the great source of infection. A great part of the excreta of these patients goes into the sewage without having been previously disinfected and in the rural districts they frequently are thrown out on the banks of a river or creek and. sooner or later get into the flowing water. At most of our inland cities the sewage is conducted to the nearest lake or stream and the cities farther down the stream are obliged to use this water for drinking and cooking purposes, often without being filtered. From the aesthetic point of view this practice cannot be too strongly condemned, but from a sanitary point of view it is a far more serious question.

We must not conclude from these statements that the drinking of this highly polluted water necessarily brings on an attack of typhoid fever, because we know from experience that such is not the case. Perhaps no city sewage contains typhoid bacilli at all times, but it is certain that the sewage from every city contains them some of the time, i. e., when the excreta from typhoid fever patients are thrown in it. Attention must here also be called to the fact that there are persons who are daily excreting large numbers of typhoid germs, although they are perfectly healthy in every way. This process of excretion may continue for a period of ten to fifteen years or even longer, during all of which times these persons are a continual source of danger to others.

We must not forget that many other intestinal disturbances besides typhoid fever are caused by the drinking of sewage polluted water. The mere drinking or a highly polluted water does not produce typhoid fever, but in order that a person may get this disease he must swallow a considerable number of typhoid germs, which must then become implanted in his system and multiply. This will produce typhoid fever and you will never have it without first taking the typhoid bacilli into your system. This taking in of the germs is usually done with polluted drinking water, which is therefore the greatest source of typhoid infection, as is shown by the following epidemics:

EPIDEMICS OF TYPHOID FEVER CAUSED BY SEWAGE POLLUTION OF DRINKING WATER.

The first carefully studied epidemic of typhoid fever which was traced undisputably to the use of water which had been polluted with the excreta from typhoid fever patients occurred at Lausen, Switzerland, in the summer of 1872. In this little village of 780 inhabitants 130 cases of typhoid fever developed within one month. As typhoid fever in this community was a rare disease a careful investigation was made which showed the following conditions: Many of the inhabitants of the village got their drinking water from a spring which was situated at the foot of a hill. On the other side of the hill was a brook which was used for irrigating the meadows on that side of the hill. In June there developed a case of typhoid fever in a man who had been away for some time and had now returned to his home near the brook, farther up the valley. Before the end of July three other cases developed in this house and all the excreta from these patients were thrown into the brook and the family also did their washing in the brook. In the latter part of July the brook was dammed and allowed to flow over the meadows below, and whenever this was done the spring on the other side of the ridge was known to increase considerably in volume. Within three weeks from the beginning of this irrigation the outbreak of typhoid fever occurred among those who used the water from the spring. It was surmised then that there must be a fairly close communication between the brook and the spring on the other side of the ridge, and in order to test this supposition they put a ton of salt into the brook and found that it soon made its appearance in the spring. There was not a direct underground connection but a communication through coarse gravel which was not fine enough to make an effective filter.

The epidemic which visited Grand Forks in the fall of 1893 also was traced to the pollution of the drinking water by typhoid-infected sewage. I am indebted to Dr. H. M. Wheeler for the following facts: Early in the fall there were a number of cases of typhoid fever at Crookston, Minn., and the excreta from these patients were thrown into the sewers. The sewers were in a bad condition and a large portion of the sewage accumulated at the edge of the town in a large cess-pool. Later in the fall this cess-pool was drained into the Red Lake river, and as this river supplied the city of Grand Forks with water, which was not filtered, the inhabitants of this city could hardly escape infection. It is therefore no wonder that there were nearly 1200 cases of tyhpoid fever in Grand Forks within about a month after the Crookston cess-pool was drained. During that winter more than 125 people died of typhoid fever in Grand Forks, all of which might have been avoided by the proper disposal of the sewage at Crookston.

A similar epidemic occurred at Plymouth, Pa., in the spring of 1885 when 1000 to 1500 persons were seized with the disease and about 125 deaths were recorded. Here the excreta from a typhoid fever patient had been thrown, during the winter, on the banks of a stream which supplied the town with water. The stream at that time was frozen over and no trouble followed until after the onset of warm weather during the latter part of March, when the infected excreta was washed into the stream. In this epidemic it was noticed that none of the families who used water from private wells had cases of typhoid fever in their homes.

Many other epidemics have been traced to the pollution of the water supply, but it is not necessary to more than mention some of them here. In 1893 Ashland, Wis., experienced a severe epidemic where the source of the trouble could easily be traced to the pollution of the city water by sewage. Other epidemics occurrred at Butler, Pa., and at Ithaca, N. Y., in 1903.

Wells also have been known to become infected and give rise to an epidemic as, for instance, in a small village in Germany in 1895. In this instance the excreta from two children sick with typhoid fever were thrown into a gutter which passed in close proximity to a well that was not properly protected at the top. Three hundred and three persons were supplied with water from this well and 94 of these were taken sick with the disease within about a month. Families living on the same street, and in some instances in the same house, but not using water from this well, were unaffected.

SEWAGE PURIFICATION.

From these data it becomes very evident that sewage polluted drinking water is one of the great sources of typhoid infection, besides being the cause of many other intestinal troubles. We are now brought face to face with the problem of sewage disposal in such a manner that it will not be allowed to pollute our water supplies. This problem of sewage disposal is not entirely settled but many facts have been learned from experiments that were carried out during the last twenty years. It is clear at least that our inland streams must not be made the carriers of human and other excretal waste products, as these waters frequently must be used for drinking purposes by other communities. At the seaboard cities it might be quite safe to conduct the sewage into the sea, but that cannot be done at the inland cities of the middle west and it seems that here the sewage will ultimately have to be subjected to some process of purification.

INTERMITTENT FILTRATION THROUGH SAND.

One of the most effective methods of sewage purification is by intermitten filtration through coarse sand. This process has been thoroughly tested and perfected by the Massachusetts state board of health and is now in use in many inland cities of the New England and other eastern states. In the state of Massachusetts about 25 of these plants are in operation. It is a most simple process and the results are eminently satisfactory if the filtering beds are given a reasonable amount of care. Where sand is easily available the construction of the beds is a simple matter, a very little more is required than to underdrain a given area with crushed stone and gravel. The beds must be three to four feet thick, divided into several sections, and large enough to give each section a rest of eight or twelve hours or longer after every "dosing." The sewage should be screened and passed through a grit chamber before it is allowed to flow on the sand beds, but does not require any other preliminary treatment, although in some parts of the country it is treated in a spetic tank before filtration. The experiments of Winslow and Phelps ("Purification of Boston Sewage," water supply and irrigation paper No. 185, U. S. geological survey) seem to show, however, that in most cases this preliminary treatment is entirely unnecessary, as equally satisfactory results are obtained without it. The sewage is distributed over the sand beds by means of branched wooden troughs. The rate of filtration varies from 25,000 to 100,000 gallons per acre per day, which shows that less than one acre of sand bed is required for every thousand inhabitants contributing sewage. The experiments at Columbus, Ohio, show that the rate of filtration can be increased to 200,000 gallons per acre daily if the sewage is treated in a septic tank for eight to ten hours before it is applied to the sand filter. In these experiments each bed was flooded only once in 24 hours which necessitated the construction of a dosing tank.

The purification is not a mere screening out of the coarse organic matter, but is a biologic process whereby this matter is completely oxidized and destroyed. This oxidation is brought about by the growth of harmless, saprophytic bacteria, algae, etc., which are usually present in sewage and grow in the sand filters. It is for this reason that the beds must be allowed to rest between the dosings, so as to give them time to become thoroughly aerated. This areration prevents their becoming putrid and offensive. The surface may occasionally become clogged and must then be raked over, but this is not usually found necessary any oftener than once every six to eight months. Occasionally the surface will have to be scraped, but not oftener than once a year, and generally less frequently than that. A properly conducted sewage filter of this kind removes over 95 per cent of the organic matter and as high as 99 per cent of the bacteria.

FILTRATION THROUGH BEDS OF CRUSHED STONE.

Another method which is becoming more popular is by means of the so-called sprinkling filters; also called "continuous," "trickling," and "percolating" filters. These beds are composed of an underdrained layer of crushed stone, brick or coke usually about twenty-five feet in thickness. The crushed stones generally vary from one-half to two inches in diameter and are underdrained with larger stones and gravel. The sewage is applied in the form of a continuous spray, either from a specially constructed nozzle or from perforated troughs, and should be scattered over the entire surface of the beds. The preliminary treatment consists in screening and passing through a grit chamber and in some instances it is septicised in a septic tank. The rate of filtration through the sprinkling filters may be as high as 2,000,000 gallons per acre daily with a nonputrescible effluent. About 60 or 70 per cent of the organic matter is removed in the treatment and as high as 75 to 80 per cent of the bacteria. The purification in this process also is biologic in character, going on under aerobic conditions whereby the organic matter is destroyed. The effluent from these filters is not as clear as that from the sand filters, but usually is satisfactory.

TREATMENT IN SEPTIC TANKS.

Another method of sewage purification is by treatment in a septic tank. This is simply a large storage tank in which the sewage flows so slowly that it requires at least eight hours to pass through the tank. The tank is generally placed in the ground and often is covered, but this is not essential except in extremely cold weather. A properly constructed and satisfactorily operating septic tank removes from 40 to 50 per cent of the organic matter from the sewage and many of the disease-producing bacteria die in the tank. This purification also is biologic in character as the putrescible organic matter is oxidized by the growth of the harmless (chiefly anaerobic) saprophytic bacteria. Some septic tanks are quite satisfactory when operated alone, but others are not satisfactory at all, except for preliminary treatment, preparatory to other purification.

The septic tank and the intermittent sand filter are sometimes combined as is the case at Ames, Iowa, and at Wauwatosa, Wis. The sewage is first septicized and then filtered through sand. This method gives eminently satisfactory results and does not require an excessive amount of care. The cost of construction of the plant at Wauwatosa, Wis. (population 3,000), was $5,300 and the average yearly expense for operating the plant is $200. This plant is always satisfactory, but the sand filter is not used during the extremely cold winter months. During these months the septic tank is used alone and is entirely satisfactory.

A combination of the septic tank with the sprinkling filter is used at some plants with satisfactory results. The rate of filtration is much higher than with the sand filters, but the effluent is not so highly purified, although it is nonputrescible.

EFFECT OF COLD ON SEWAGE PURIFICATION WORKS.

We may now ask, "what is the effect of extreme cold on these sewage filters?" This question can not be answered entirely satisfactorily because there are none of these plants in operation in North Dakota. In most of the cities in Massachusetts where the intermittent sand filters are used fairly satisfactory results are obtained in the coldest winter weather. There the sand is deeply furrowed in the autumn, ice is allowed to form over the top of the furrows and the sewage is then allowed to flow into the furrows, under the ice. The beds do not freeze enough to interfere with the filtration. At Columbus, Ohio, however, most of the sand filters that were experimented with froze to a great depth and could not be used in winter. In that locality the sprinkling filters work better during the winter months than the sand filters.

Before this question can be answered for North Dakota several types of filters must be thoroughly tested by competent observers.

The individual cities which must install sewage purification plants because they are restrained from allowing their sewage to flow into some man's fields cannot well afford to take up the problem and solve it for the benefit of every city in the state.

May, 1908.

FINANCIAL REPORT OF THE SECRETARY OF THE BOARD OF TRUSTEES

November 2, 1908.

To the Board of Trustees, University of North Dakota:

Gentlemen: I have the honor to submit herewith my report as secretary of the Board of Trustees for the biennial period ending June 30th, 1908.

Respectfully,
J. W. Wilkerson,
Secretary of Board.

STATEMENT.

TOTAL RECEIPTS AND DISBURSEMENTS FROM JULY 1, 1906, TO JULY 1, 1907.

SUMMARY OF RECEIPTS.

	Maintenance Funds and Students' Fees	Special Funds	State App.
Interest and income from lands	$ 47,803.70		
Mill tax fund	67,358.07		
Repairs on main building	....	....	$ 18,235.03
Receipts from students' fees: Laboratory, $2,366; tuition law school, $3,972.50; library fees, $1,305.35; matriculation, $2,654; rent, $5,348.52; miscellaneous, $485.70	16,132.07		
Geological survey	....	....	1,000.00
James J. Hill library fund	....	145.67	
Great Northern siding	912.93		
Miscellaneous receipts	1,548.93		
Athletic association	....	663.50	
Boarding department	....	24,116.05	
Student remittance account	....	1,336.36	
Forfeit fees of students	....	1,635.00	
Icelandic library fund	....	35.00	
Scandinavian library fund	....	316.00	
Summer school	....	1,835.50	
Bills payable account (borrowed to pay salaries in accordance with resolution of board of trustees)	....	30,000.00	
Total	$133,755.70	$60,083.08	$ 19,235.03
Gross receipts	....	....	$213,070.81

SUMMARY OF DISBURSEMENTS.

	Maintenance Funds	Special Funds	State Appropriations
General maintenance, janitor service, repairs, grounds, departments, etc.	$ 30,387.65		
Gymnasium building	614.31		
James J. Hill library fund	....	$ 145.67	
Interest	965.15		
Carnegie library building	....	1,507.49	
School of mines building	512.54		
Power, heat and light	13,339.02		
Repairs on dormitories	226.75		
Repairs on main building	....	....	*18,754.61
Salaries of instructors and officers	65,398.49		
Sewer	22.41		
Warrants issued in 1901	16,000.00		
Athletic association	....	725.50	
Boarding department	....	23,574.73	
Celtic library fund	....	21,38	
Icelandic library fund	....	99.11	
Scandinavian library fund	....	90.33	
Students' remittance account	....	1,333.06	
Students' forfeit fees	....	41.80	
Summer school	....	2,517.73	
Bills payabe account	....	30,000.00	
Total	$127,466.32	$60,056.80	$ 18,754.61
Gross expense			$206,277.73

Cash balance on hand July 1st, 1906	$ 16,367.29	$
Gross receipts from July 1st, 1906 to July 1st, 1907	213,070.81	
Gross expenses from July 1st, 1906 to July 1st, 1907	....	206,277.73
Cash balance on hand July 1, 1907	....	23,160.37
	$229,438.10	$229,438.10

*The appropriation made by the legislature for the repairs to this building on estimates submitted by the board of trustees before the repairs were completed was insufficient and the balance, $519.58, was taken from the maintenance fund.

CLASSIFIED REVENUE AND EXPENSE.

Balance on hand July 1, 1906	$ 16,367.29
Received from:	
Administration department	33.35
Advertising	.13
Analysis work	368.75
University athletic association	663.50
Band account	91.12
Bills payable account	30,000.00

Bills receivable account	17.00
Biological department	89.75
Boarding department	24,116.05
Chemical department	524.10
Commercial department	1,067.18
Domestic science department	10.70
Students' remittance account	1,333.36
Forfeit fees	1,635.00
Geological department	91.50
Geological survey	1,000.00
Grounds account	31.00
James J. Hill library fund	145.67
Ice account	1.43
Icelandic library fund	35.00
Interest	3.15
Janitor account	4.35
Law department	4,023.50
Library fund	1,509.35
Matriculation	2,654.00
Mechanical engineering department	258.69
Medical department	266.00
School of mines fund	6.61
Miscellaneous account	616.77
Philo-Bennett prize fund	36.00
Physics department	170.00
Power, heat and light account	378.40
Rental of dormitory rooms	5,348.52
Repairs on main building account	5.55
Scandinavian library fund	316.00
Great Northern Siding	912.93
State of North Dakota:	
Mill tax fund	67,358.07
Interest and income from lands	47,803.70
Appropriation for repairs on main building	18,235.03
Summer school	1,835.50
Teamster account	49.10
Telephone account	15.50
Water rent account	9.50
	$229,438.10

Expended on:

Administration department	$ 1,486.62
Advertising	1,001.75
Analysis work	352.62
Anatomical department	122.06
Athletic account	149.95
University athletic association	725.50
Band account	115.19
Bills payable	30,000.00
Biological department	490.06
Boarding department	22,430.26
Boarding department quarters	584.29
Boarding department store room	560.18
Celtic library fund	21.38
Chemical department	1,101.17
Commercial department	980.97
Domestic science department	.50
Engineers' memorial fund	6.25

English department	20.67
Students' remittance account	1,333.06
Students' forfeit fees	41.80
Geological department	340.90
Geological survey	426.81
Greek and Latin department	8.35
Grounds account	2,007.10
Gymnasium building account	614.31
James J. Hill library fund	145.67
History department	9.98
Ice account	385.82
Icelandic library fund	99.11
Interest account	965.15
Janitor account	1,658.14
Law department	4,185.30
Lecture account	192.78
Library fund	2,849.45
Librarian of congress	25.00
Carnegie library building	1,507.49
Mail messenger service	100.08
Mathematics department	27.81
Matriculation	15.00
Mechanical engineering department	1,561.81
Medical department	546.94
School of mines fund	1,393.19
School of mines building	512.54
Miscellaneous account	2,356.37
Teachers college department	117.26
Nursing account	140.83
Philo-Bennett prize fund	36.00
Physics department	666.36
Political science department	10.00
Power, heat and light	13,339.02
Public health laboratory	32.10
Rent account	78.80
Repairs account	3,254.15
Repairs on cottage	75.75
Repairs on Davis hall	138.00
Repairs on main building	18,754.61
Repairs on Budge hall	13.00
Salaries	65,398.49
Scandinavian library fund	90.33
Sewer account	22.41
Summer school account	2,517.73
Teamster account	921.61
Telephone account	323.24
Warrants issued in 1901	16,000.00
Water rent	888.66
Balance on hand July 1, 1907	23,160.37
	$229,438.10

STATE APPROPRIATION

For Expenses Incurred in Repairs Made to the Main Building, July 1, 1906 to July 1, 1907.

RECEIPTS.

From appropriation (S. B. No. 186)	$ 18,235.03

DISBURSEMENTS.

Bailes & Perkins	1,500.00
B. O. Paulsness	600.00
Journal Printing Co.	1.28
The Herald	3.30
Bailes & Perkins	5,000.00
B. O. Paulsness	113.07
Prather & McGuire	200.00
American Blower Co.	657.00
Great Northern Ry. Co.	11.02
Northern Pacific Ry. Company	1.21
U. N. D. (four workmen)	96.30
Electric Appliance Co.	35.81
Bailes & Perkins	2,000.00
B. O. Paulsness	300.00
Prather & McGuire	250.00
C. H. Wallinger	100.00
Bailes and Perkins	1,000.00
Prather and McGuire	510.00
B. O. Paulsness	380.00
Geo. W. Colburn Supply Co	117.00
C. A. Rheinhart	2.10
Bailes and Perkins	3,000.00
A. I. Widlund	.53
U. N. D.	2.40
G. N. Ry. Co	2.72
Bailes and Perkins	1,157.00
Barnes and Nuss Company	2.00
R. B. Griffith	62.74
Grand Forks Elec. Const. Co	50.97
Geo. W. Colborn Supply Co	64.28
R. B. Cadwell	2.00
G. N. Express Co	.70
N. W. Telephone Co.	1.00
H. J. Monley	1.50
G. N. Ry. Co	62.28
Robinson & Cary Co.	19.31
Robinson & Cary Co	3.16
N. W. Tel. Co	.20
Canniff Co	3.00
Yale & Towne Mfg. Co	19.05
G. N. Ry. Co	.53
G. N. Express Co.	2.30
Barnes & Nuss Co	11.20
Dinnie Brothers	6.00
Robertson Lumber Co	19.00
American Blower Co	9.50
Barnes & Nuss Co	31.10
St. Paul Elec. Co	13.80
Grand Forks Foundry Co	3.20
Spriggs Bros	12.50
Robinson & Cary Co	5.65
G. N. Ry. Co	.62
Bailes and Perkins	385.00
Bailes and Perkins	109.75
Barnes & Nuss (on ventilating plant)	291.95
	$ 18,235.03

STATE APPROPRIATION

For Carrying on a Geological Survey of the State, July 1, 1906 to July 1, 1907.

RECEIPTS.

From appropriation	$	1,000.00

DISBURSEMENTS.

Debit balance from previous year	$	75.65
Miscellaneous repairs		29.25
Salary of geologist and his assistant		425.00
Leslie Stinson		2.00
A. G. Leonard		101.90
Don McDonald		.75
C. H. Clapp		24.45
G. N. Ry. Co		1.45
University book store		.73
Chas. H. Clapp		50.60
G. N. Ry. Co		2.00
N. P. Ry. Co		1.23
R. B. Griffith		6.25
University book store		.60
Repairs		1.85
R. B. Griffith		3.15
Repairs		1.91
N. P. Express Co		2.90
University book store		2.10
St. Paul Stationery Co		2.35
G. N. Express Co		2.78
Axel Nelson		30.00
Ira Hutchinson		2.50
University book store		2.35
A. G. Leonard		50.70
Marcia Bisbee		120.00
University book store		2.00
E. J. Babcock		15.95
Balance on hand July 1, 1907		37.60
	$	1,000.00

FINANCIAL STATEMENT

JULY, 1907—JULY, 1908.

SUMMARY OF RECEIPTS

	Receipts from Maintenance Funds and Student Fees	Special Funds	State Appropriations
Interest and income from lands	37,437.17	....	....
Mill tax fund	79,487.32		
Miscellaneous receipts	2,133.71		
Notes receivable	....	$ 154.09	
Boarding department	....	27,074.41	
Forfeit fees (students')	....	1,591.35	
Geological survey	....	....	$ 1,000.00
Combined gymnasium, assembly hall and armory	....	....	24,740.00
Library (for books)	....	....	1,000.00
Andrew Carnegie library building fund	....	30,000.00	
James J. Hill library fund	....	397.85	
Scandinavian library fund	....	475.64	
School of mines building	....	....	18,998.00
U S. government for co-operation with school of mines in testing North Dakota coals for producing gas, etc	....	300.00	
Public health laboratory	....	....	7,000.00
Repairs on Macnie hall	....	....	6,470.38
Repairs on Davis hall	....	....	3,529.62
Students' remittance account	....	1,394.02	
Sewer	....	....	9,760.45
Receipts from student fees and tuition in the law school	17,851.22		
Summer school	....	2,114.55	
Total	$136,909.42	$ 63,501.91	$ 73,498.45
Gross receipts	....	....	$273,909.78

SUMMARY OF DISBURSEMENTS

	Expended From General Maintenance Funds	Special Funds	State Appropriations
General maintenance, janitor service, repairs, grounds, departments, etc.	$ 54,029.24		
Boarding department		$ 26,811.76	
Forfeit fees (students')		1,610.68	
Geological survey			$ 1,029.15
Combined gymnasium, assembly hall and armory			24,740.00
Andrew Carnegie library building fund		27,616.50	
Celtic library fund		21.38	
James J. Hill library fund		397.85	
Icelandic library fund		98.01	
Scandinavian library fund		682.35	
School of mines building			19,998.00
Co-operation with U. S. government in testing North Dakota lignite coals	758.58	92.00	
Experimental mining station (S. B. 285)	754.73		
Power, heat and light	15,984.37		
Public health laboratory			5,438.65
Repairs on Macnie hall			4,880.38
Repairs on Davis hall			5,119.62
Salaries of instructors and officers	74,932.80		
Sewer			9,760.46
Students' remittance account		1,394.02	
Summer school		2,562.20	
Total	$146,459.92	$ 61,286.75	$ 70,966.26
Gross expenses			$278,712.73
Cash balance on hand July 1, 1907		$ 23,160.37	
Gross receipts from July 1, 1907 to July 1, 1908		273,909.78	
Gross receipts from July 1, 1907 to July 1, 1908		273,909.78	
Cash balances on hand July 1, 1908 in the following funds: Boarding department, $1,237.98; students' forfeit fees accoount, $1,309; Carnegie library building, $225.80; Scandinavian library fund, $2,262.37; U. S. coal testing fund, $208; summer school fund, $965.16; geological survey, $40.27; public health laboratory fund, $1,356.72; Icelandic library fund, $698.74; general fund, $10,139.88			18,357.42
Total		$297,070.15	$297,070.15

CLASSIFIED REVENUE AND EXPENSE.

Balance on hand July 1, 1907	$ 23,160.37
Received from:	
Administration	16.64
Advertising	3.75
Analysis	63.50
Physical culture	.50
University athletic association	33.70
Band	67.30
Bills receivable	154.09
Biology	1.00
Boarding department	27,074.41
Chemisty	18.60
Commercial	10.00
Domestic science	7.40
Students' remittance account	1,394.02
Students' forfeit fees	1,591.35
Geological survey	1,000.00
Grounds	570.48
Gymnasium, assembly hall and armory	24,740.00
History	1.92
Ice account	34.00
Library	1,004.00
Carnegie library building	30,000.00
James J. Hill library fund	397.85
Icelandic library fund	35.89
Scandinavian library fund	475.64
Mathematics	.25
Medical college	3.58
Mines, school of	1.00
Mines building, school of	19,998.00
U. S. government for co-operation with school of mines in coal testing	300.00
Miscellaneous account	114.18
Philo-Sherman Bennett prize	36.00
Power, heat and light account	1,005.52
Public health laboratory	7,018.50
Rent	13.78
Repairs	41.73
Repairs on cottage account	6,470.38
Repairs on Davis hall account	3,529.62
Sewer	9,760.45
State—Interest and income from lands	37,437.17
Mill tax	79,487.32
Student receipts:	
Matriculation, $2,634; rent, $6,741.16; law, $3,360.75; library, $1,211.75; laboratory and miscellaneous, 3,903.56.	17,851.22
Summer school	2,114.55
Teamster account	10.61
Telephone	5.63
Water rent	14.25
Total	$297,070.15
Expended on:	
Administration	$ 1,442.25
Advertising	1,972.87

Analysis	53.25
Anatomy	63.98
Physical culture	196.23
University athletic association	568,57
Band	515.70
Biology	224.13
Boarding department	26,811.76
Chemistry	1,164.07
Commercial	347.70
English	9.53
Students' remittance account	1,394.02
Fire department	207.77
Students' forfeit fees	1,610.68
French and Spanish	20.70
Geology	336.81
Geological survey	1,029.15
Greek	22.60
Grounds	2,826.98
Gymnasium, assembly hall and armory	24,740.00
Preliminary and miscellaneous expenses, furniture, fixtures, etc., of gymnasium, assembly hall and armory	2,768.57
History	55.52
Ice account	135.69
Interest	560.64
Janitor account	2,622.93
Latin	1.10
Law	4,827.71
Lecture	64.80
library	2,084.64
Carnegie library building	27,616.50
Preliminary expenses Carnegie library building	103.45
Celtic library fund	21.38
Hill library fund	397.85
Icelandic library fund	98.01
Scandinavian library fund	682.35
Mail messenger service	91.65
Mathematics	204.91
Applied mathemathics	130.00
Mechanical engineering	1,896.35
Medical college	548.68
Mines, school of	1,654.81
Mines building, school of	19,998.00
Preliminary expense, furniture, fixtures, etc., school of mines building	3,988.85
Co-operation with U. S. government in coal testing	850.58
Experimental station (senate bill 285)	754.73
Moving and setting up mines equipment	543.51
Miscellaneous account	2,223.97
Teachers college	107.51
Nursing	186.05
Philo-Sherman Bennett prize	36.00
Physics	434.09
Political science	19.00
Power, heat and light	15,984.37
Balance on wiring main building contract	104.50
Public health laboratory	5,438.65
Rent	110.68
Repairs (general)	5,282.84

Repairs on Macnie hall (cottage)	4,880.38
Repairs on Davis hall	5,121.66
Repairs on main building	352.17
Repairs to Budge hall	755.05
Salaries of instructors and officers	74,932.80
Scandinavian fund	54.13
School administration	99.55
Sewer	9,760.46
Preliminary expenses, machinery, etc., for pumping station and sewer	901.40
Sociology	51.72
Steam mains to new buildings	3,622.76
Students' receipts refunded	51.15
Summer school	2,562.20
Teamster account	438.64
Telephone account	146.69
Tunnels	3,277.23
Water mains	1,412.43
Water rent	909.61
Furniture and fixtures for Macnie hall	1,193.08
Balance on hand July 1, 1908	18,357.42
Total	$297,070.15

STATE APPROPRIATION

For Carrying on a Geological Survey of the State—July 1, 1907 to July 1, 1908.

RECEIPTS.

From appropriation	$ 1,000.00
Credit balance from previous year	37.60
Total	$ 1,037.60

DISBURSEMENTS.

Kennedy Bros. company	$ 19.03
W. and L. E. Gurley	6.60
Great Northern Ry. Co.	1.40
Northern Pacific Ry. Co.	15.90
H. C. Short	67.50
W. J. Smith	50.00
Keuffel & Esser	3.00
J. W. Bliss	50.00
A. G. Leonard (salary and expense account)	366.00
Northern Pacific Ry. Co.	1.10
V. J. Melstad (salary and expense account)	119.50
John G. Barry	20.00
University Book Store	12.00
Great Northern Ry. Co.	.36
Northern Pacific Ry. Co.	28.31
Great Northern Express Co.	6.77
John G. Barry	20.00
St. Paul Book & Stationery Co.	5.50
C. H. Crouch	21.00
N. P. Ry. Co.	7.48
John G. Barry	40.00
N. P. Ry. Co.	6.02
Book store	1.00

The Herald Printing company	3.00
John G. Barry	20.00
G. N. Ry. Co.	1.85
Clasp Envelope company	6.75
Postoffice department	.80
John G. Barry	20.00
G. N. & N. P. Ry. companies	1.58
John G. Barry	40.00
Disbursing clerk	1.60
University Book Store	11.50
The Herald Printing company	3.75
Francis Bannerman	18.03
Balance on hand July 1, 1908	40.27
Total	$ 1,037.60

STATE APPROPRIATION

For the Erection of a Combined Assembly Hall, Armory and Gymnasium.
July 1, 1907 to July 1, 1908.

RECEIPTS.

From appropriation	$ 24,740.00

DISBURSEMENTS.

Harry C. Knisely company	$ 2,220.00
Berge & Hodson	20,555.00
Spriggs Brothers	1,190.00
White City Electric company	775.00
Total	$ 24,740.00

STATE APPROPRIATION

For the Purchase of Books for the Library
July 1, 1907 to July 1, 1908.

RECEIPTS.

From appropriation	$ 1,000.00

DISBURSEMENTS.

Gustav Fock	$ 28.93
A. C. McClurg & Co.	52.17
G. E. Stechert & Co.	382.79
St. Paul Book & Stationery Co.	476.41
N. J. Bartlett & Co	11.80
John W. Cadby	14.90
Peabody Institute	33.00
Total	$ 1,000.00

STATE APPROPRIATION

For the Erection of a Building for the School of Mines,
July 1, 1907 to July 1, 1908.

RECEIPTS.

From appropriation	$ 19,998.00

DISBURSEMENTS.

Dinnie Brothers	$ 19,998.00

STATE APPROPRIATION

Appropriation of $2,000.00 for Equipment and $5,000.00 Annually for the Maintenance of a Public Health Laboratory.
July 1, 1907 to July 1, 1908.

RECEIPTS.

From appropriation	$ 7,000.00
From city of Grand Forks for annalysis	18.50
Total	$ 7,018.50

DISBURSEMENTS.

Emerich Rosenberg	$ 30.00
H. W. Hill	3.00
Union Paper company	51.00
Press Pub. Co.	8.00
Central Scientific Co.	48.38
Earl Crary	18.60
Grand Forks Mercantile Co.	4.37
St. Paul Book & Stationery Co.	9.83
Press Publishing Co.	60.00
Dacotah Pharmacy	1.30
Herald Printing company	25.00
Schlaberg & Griffin	3.30
W. T. Keener & Co.	20.30
John H. Vold	1.10
Mary Hefferan	3.00
John A. Johnson	7.25
H. Westergaard	.75
E. H. Sargent & Co.	43.00
Envilla Stock Farm	14.60
Whiteall Tatum Co.	27.68
John A. Johnson	7.80
M. A. Brannon	5.50
Monley & Smith	2.35
John A. Johnson	13.40
R. B. Cadwell	.35
L. H. White	4.50
M. A. Brannon	50.00
Colborn Supply Co.	47.62
B. O. Paulsness	16.90
Barnes & Nuss	52.65
Standard Oil Co.	28.60
St. Paul Book & Stationery Co.	52.95
E. R. LeCount	50.00
M. Norman & Co.	4.00
L. H. White	4.50
Herbert Allen	.62
J. W. Penwarden	2.80
Herbert Allen	1.44
J. W. Penwarden	1.31
Geo. H. Wilder	1.50
Jas. Turner & Sons	167.00
Spriggs Bros.	2.50

Barnes & Nuss Co.	18.15
Oliver Typewriter Co.	62.50
Stewart Bros.	.30
Grand Forks Merc. Co.	2.94
M. Norman & Co.	25.00
Geo. H. Wilder	.70
John H. Vold	2.25
Jas. Turner & Sons	5.00
Standard Oil Co.	13.20
A. L. McDonald	18.00
John A. Johnson	6.75
Union Paper Co.	36.18
John A. Johnson	1.40
Postmaster, Grand Forks, for stamps	20.00
John H. Vold	4.15
W. T. Keener & Co.	88.75
Herald Printing company	14.50
Postmaster, Grand Forks	3.00
Axel Nelson	45.20
Ontario Store	36.26
Illinois Glass company	13.01
Ernst Leitz	827.00
Bausch & Lomb Optical company	343.38
Noyes Brothers & Cutler	33.43
Freight and express	101.41
G. E. Stechert & Co.	84.60
University Book Store	68.78
Northwestern Telephone company	15.45
Model Steam Laundry	6.75
E. J. Babcock	25.00
Gustav F. Ruediger (for year's salary)	2,500.00
Duncal Leonard	150.00
Supplies purchases from other departments (transfers)	189.99
Total	$ 5,661.78
Balance on hand July 1, 1908	1,356.72
Total	$ 7,018.50

STATE APPROPRIATION

For Needed Repairs to the Young Women's Dormitories Known as Davis Hall and The Cottage.

RECEIPTS.

From appropriation	$ 10,000.00

DISBURSEMENTS.

Bailes & Perkins (contract)	$ 6,779.00
St. Hilaire Lumber company	1,227.03
Robertson Lumber company	452.35
Spriggs Brothers	830.74
Red River Valley Brick Corporation	221.25
C. H. Hurd	264.75
J. H. Lambe	224.88
Total	$ 10,000.00

STATE APPROPRIATION

To Construct a Sewer from the State University and School of Mines to Connect with the City Sewer of the City of Grand Forks at the Nearest Point.

July 1, 1907 to July 1, 1908.

RECEIPTS.

From appropriation	$ 9,760.45

DISBURSEMENTS.

Lykken, Robinson & Wardrope	$ 1,217.20
Lykken, Robinson & Wardrope	1,309.00
Lykken, Robinson & Wardrope	1,275.00
Lykken, Robinson & Wardrope	3,082.11
Lykken, Robinson & Wardrope	1,555.50
Lykken, Robinson & Wardrope	742.75
Lykken, Robinson & Wardrope	578.90
Total	$ 9,760.46

Respectfully,
J. W. WILKERSON,
Secretary Board of Trustees.

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